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CONTENTS.

	Page.
Mr. Haupt and the Monetary Conference	193
The Mining Stock Association and the Comstock Ring	193
The Sutro Tunnel Suits	193
The Lease System in Mining	193
United States Production of Gold and Silver in 1892	194
The Future of Platinum	194
Books Received	195
New Publications	195
Discovery of Bauxite in Alabama—H. McCalley	195
Analysis of Ferro-Silicon and Silicious Spiegel—C. Platt	195
The Crawford Crushing and Amalgamating Mill	195
Simon-Carves Coke Ovens—W. Schroller	195
Use of Burnt Lime in Lead Blast Furnaces—S. E. Bretherton	196
Persistance of Lodes in Depth	196
* **The Coal Fields of Montana**—W. H. Weed	197
Valentine's Estimate of the Production of Metals in 1892	198
Abstracts of Official Reports	198
* **Geological Occurrence of the Broken Hill Ore Deposits**, E. F. Pittman	199
Compound Locomotives in Express Service	199
Relation Between Ore Deposits and Their Disclosing Walls, H. W. Fairbanks	200
* **The Jeffrey Steel Cable Conveyor**	201
The Irrigation Question from a Botanical Standpoint—F. V. Coville	201
Abstract of Recent Decisions	202
* **An Electrical Furnace for the Laboratory**	203
* **The Reynolds Horse Whim**	203
Dividends Declared	203
Notes—Mineral Exports of Newfoundland, 196—Storing Steam Heat 196—Assay Commission, 197—Production of Metallic Chromium by Electrolysis, 201—Electricity in Mining Schools, 202—Launch of the "Indiana," 202—The Panama Canal, 203—French Imports and Exports of Ores, 203—French Mines, 203—Comparative Tests of Cut and Wire Nails, 203.	

* Illustrated.

MINING NEWS.	Virginia 208	Buffalo 210	Colo. Springs. 216
Alabama 205	Washington 208	Chicago 210	Rico 216
Arizona 205	West Virginia 208	Louisville 211	Baltimore 216
California 205	Wyoming 208	Philadelphia 211	London 216
Colorado 206	Utah 208	Pittsburg 111	Paris 216
Georgia 206		COAL:	Aspen 216
Idaho 206	FOREIGN.	New York 211	St. Louis 216
Illinois 206	Mexico 208	Boston 212	Duluth 216
Michigan 206	MINING STOCK	Buffalo 212	Denver 216
Missouri 206	MARKETS:	Chicago 212	
Minnesota 206	New York 208	Pittsburg 212	CHEMICALS AND MINERALS 212
Montana 206	Boston 209		
Nevada 206	Colo. Springs. 209	MINING STOCK TABLES:	CURRENT PRICES:
New Mexico 207	San Francisco. 209	New York 214	Chemicals 213
Ohio 207	MARKETS:	Boston 214	Minerals 213
Oregon 207	METALS 209	San Francisco. 216	Rarer Metals. 213
Pennsylvania 207	IRON;	Coal Stocks 216	ADVT. INDEX 19
South Dakota 208	New York 210		

OUR reference last week to Mr. OTTOMAR HAUPT, as "the statistician of the recent Monetary Conference," and which statement we had taken from one of our foreign exchanges, was, we are informed, erroneous, inasmuch as Mr. HAUPT was not recognized by the Conference in that or any other capacity, and his estimates are simply those of a newspaper reporter.

THE Mining Stock Association has won another victory over the Comstock mill ring, inasmuch as the Supreme Court has held that the bond given by the defendants in the Hale & Norcross suit, against whom judgment of over a million dollars was entered, was insufficient The Guaranty Company, which signed the bond, it was clearly proven, was organized for this specific purpose by Alvinza Hayward. It had a capital of $100,000, which the court decided was entirely inadequate for a surety on a bond many times in excess of that amount.

THE suit brought by FRANK T. SYMMES *et al.* against the Union Trust Company, of this city, in which the plaintiff seeks the recovery of the Sutro Tunnel property, now owned by the Comstock Tunnel Company, is being tried in Carson, Nev., before Judge THOMAS P. HAWLEY, of the United States Circuit Court.

It will be remembered by readers of the ENGINEERING AND MINING JOURNAL that this suit is the outcome of the old McCalmont mortgages, and as the decision of the court will be of the utmost interest to mining men acquainted with Comstock affairs, a brief summary of the history of the financial complications of the Sutro Tunnel Company will not be out of place.

MCCALMONT BROS. & CO., bankers of London, loaned the Sutro Tunnel Company a half million dollars in 1877, the payment of which with interest was secured by a mortgage covering the property, a clause in which permitted the mortgagees to foreclose for non-payment of interest.

In 1881 the company was unable to pay the interest, and the MCCALMONTS, after waiting five years, proceeded to foreclose in 1886, when the date of absolute foreclosure was set for January 1st, 1889.

THEODORE SUTRO, however, made strenuous efforts to retain possession of the property. The indebtedness to the MCCALMONTS at that time with accrued and compounded interest amounted to nearly one and one-half millions of dollars. This large sum SUTRO managed to reduce to about $800,000 on the ground that the mortgagees, having control of the Board of Trustees, had made arrangement in their own favor and prejudicial to the interest of the stockholders. The MCCALMONTS finally agreed to accept $800,000 as payment in full for their claims, provided this sum was paid by January 1st, 1888.

This money SUTRO was unable to raise in time, but he finally succeeded in persuading the Union Trust Company to take up the mortgage. Attempts were then made to secure co-operation on the part of the stockholders and a scheme of reorganization was draughted, but the Union Trust Company was obliged to foreclose October 1st, 1888. Under this decree of foreclosure all the property of the Sutro Tunnel Company was sold to the Union Trust Company on January 14th, 1889, for the sum of $1,325,000 The time of redemption expired, the Sutro Tunnel Company making no effort to regain possession of it, and finally the Comstock Tunnel Company was organized after its present plan, many of the old stockholders becoming interested under a plan of reorganization according to which the opportunity was given to every interest in the old company to join.

The plaintiffs in this suit, now being tried, claim that the decree of foreclosure and sale was obtained by fraud, and seek that the Union Trust Company be declared merely a trustee of the Sutro Tunnel Company. The lawyers for the plaintiff opened the trial with charges of constructive fraud and collusion on the part of THEODORE SUTRO with the Union Trust Company, but later declared that actual fraud had been committed in permitting the sale of the property. The defense claims that the suit is the result of a conspiracy on the part of the plaintiff, and that the bill of complaint contains no matter which entitles them to any relief.

We have no comment to make on the above.

THE LEASE SYSTEM IN MINING.

The lease system as practiced in Colorado, to a greater extent probably than any other of our Western States, has some admirable features, with a few seriously unfavorable ones. To this subject, which, we think, hardly sufficient attention has been paid by mining men, interest is attracted by a paper read by Mr. BENJAMIN B. LAWRENCE, of Denver, Colo., at the Montreal meeting of the American Institute of Mining Engineers.

Of course, the system as practiced in Colorado can be maintained where there is a large available force of laborers. It would hardly be possible, for instance, to secure miners for a mine in a remote district by promises of leasing work only, as this would not be definite enough for the miner to rely upon his earnings

This system, called tributing, originated in Cornwall, and is extant there to this day. Cornish miners, so prevalent in our Western mining camps, introduced it in this country, but it was formerly accepted as a last

resource only when the expense of prosperity deterred the management from exploration work, or when the mine was considered ready for abandonment. Such at least was the feeling in Eureka and Austin, Nevada, two of the camps where tributing was introduced at an early day, and the mining men were wont to refer to such work as disgraceful and tending to the ruin as well as the despoilation of the mine.

Nor were they altogether wrong. The miner rarely works for improvement account. If the timbering is done by him at his own cost he will prefer to use merely temporary sets and stagings which are sufficiently strong to allow the extraction of the ore bed rock enough to hold the ground secure for any length of time. Instead of the drifts being driven straight and level they are frequently tortuous and uneven at the bottom, the miner regarding them not as permanent entrances to an ore body, as a good miner should, but merely as conveniences for the outlet of an uncertain amount of ore which he has contracted to mine. If the ore is milled at the mine the contractor is indifferent; if he is paid by the car load or ton, to the clean separation of waste, he will prefer to get rid of it by sending up with the ore.

The sharp contrast to these results is the working of the leasing system at Georgetown, Colo., where several of the more important and ecomically worked mines, such as the Colorado Central Mining Company, have adopted the leasing system with entirely favorable results. Here, however, the workmen, whether lessees or not, are directly under the superintendence and must conform to the rules and regulations of the management. The advantages which are here named for the system are enumerated by Mr. LAWRENCE under nine heads, which may be condensed into the following epitome: When a mine is worked under the leasing system it can be operated with a small capital; the profits are net; the lessee is bound to assort the ore with care; the mine is not liable to a mechanics' lien; the lessee is responsible for accidents occurring through carelessness; little supervision of the men is required; supplies are used with economy, the men having to pay for them; the miners are adventurous prospectors; and last, but what is in reality the most convincing argument is that it has proved a great financial success in Georgetown.

While some of the advantages cited by Mr. LAWRENCE may be hypothetical and others trivial, one of them, the possibility of working a mine with small capital, is undoubtedly one of great importance, and one scarcely less subordinate is that the men will not shirk their work. Every mine foreman knows how much time is lost through this cause and can appreciate any system which will prevent it. For the men themselves such a system is preferable, as it appeals to their ambition and offers them opportunities for making far more than ordinary wages.

That this system which is now being introduced extensively in Aspen and Leadville will be adopted in many other mining camps we have no reason to doubt, and less that, under proper supervision, it will prove economical.

THE UNITED STATES PRODUCTION OF GOLD AND SILVER IN 1892.

The abstract of the report of the Director of the United States Mint printed last week in these pages contained, as usual, much useful information given with a promptness which adds greatly to its value. These statistics of the production of the precious metals in this and other countries have, deservedly, been accepted as authoritive, even the elaborate census investigation for the year 1889 having added but little to the amount of silver and nothing to the gold reported more than a year before by the mint.

The director has heretofore usually obtained his figures of production by adding, to the amount of gold and silver turned out by the several refiners, that exported in ores, matte, etc., and that deposited in the mints as "unrefined," care being taken, in analyzing these reports, to prevent duplications and to ascertain the amount derived from foreign ores or bullion treated in this country. With such precautions the results give, with great accuracy, *the production, in final marketable form*, of each metal during the year. The abstract of the mint report this year does not explain why the director has abandoned this customary and, as we believe, correct manner of estimating the production: but in a recent interview with a representative of the ENGINEERING AND MINING JOURNAL, while admitting that the reports of refiners show a large increase in silver over 1891, he stated that he was taking the reports of the United States assayers and officers of the branch mints as to the amount of the precious metals *actually mined* (not refined or marketed) during the year. From the general information obtained by them from persons more or less acquainted with the chief mining districts, these agents conclude that the output of silver declined during the year, and the Director of the Mint, basing his estimates upon their reports, says, in the abstract of his report for 1892, "The product of silver from our own mines is placed at 58,000,000 ounces, . . . a falling off of 330,000 ounces from the product of the preceding year."

We understand that in the final report the director will explain fully why he has adopted this method of arriving at the production of silver, and will also give, as usual, the amount returned by the refiners. In the meantime the bare, unexplained statement that there has been a reduction instead of an increase in the output of silver may lead to erroneous impressions; and since we have just concluded, for use in "The Mineral Industry" volume, the collection of the statistics of production of gold and silver, we are able to supplement this report of the Director of the Mint with the figures compiled in the manner heretofore followed by him.

Reports have been received by us from each refiner in this country, and, at our request, each has again checked and confirmed his figures, which give *the amount of gold and silver put by each works in final, refined, marketable form and which could not therefore be returned or duplicated by any other refiner.* To these amounts are added the amount exported in ore and matte and the "unrefined" deposits at the mints (which we assume to have been refined there). Each smelter, and refiner has also given the amount of silver so refined that came from foreign ores or bullion. This amounted to about 14,000,000 ounces and is not included in the net returns given in the following table.

The statement from the Mint report for 1891 is annexed for comparison in order to show how the total product was then arrived at.

	1891.		1892.	
	Gold, ounces.	Silver, ounces.	Gold, ounces.	Silver, ounces.
Product of refiners from domestic ores.....	918,514	51,264,337	925,000	60,016,178*
Exported in ore, matte, etc	4,568	888,553	9,262	1,572,931
Deposits of unrefined at U. S. Mints.....	681,919	3,179,080	673,698	3,317,933
Totals.....	1,605,009	58,331,970	1,607,960	64,907,042
Mint report	1,604,840	58,330,000	$33,000,000	58,000,000†

* Provisional.

† Amount estimated by the Director of the Mint to have been actually produced by the domestic mines in 1892.

It is clear that if the Director's statement represents correctly the output of the mines during the year, and we have no data either confirming or discrediting it, and the amount of refined silver produced was very much greater, the difference would represent a reduction in stocks of ore and base bullion on hand, and since these stocks have not heretofore been counted, this difference should be stated, or a portion of the country's production would be altogether unaccounted for.

Our experience in collecting the statistics of the precious metals for the census fully confirmed our belief that the method heretofore usually followed by the Mint of taking the returns of the refiners, including the Mint itself, and adding the silver exported in ore, matte, etc., is a far simpler, quicker and more accurate method than any other that can be adopted, and the results obtained by it and given in the admirable annual reports of Director LEECH have been altogether satisfactory and deserving of the fullest confidence.

THE FUTURE OF PLATINUM.

The fact that one of the great electric light companies has introduced a lamp that contains no platinum, the use of which has been heretofore considered indispensable, makes pertinent the query: What will be the future of this metal?

Since the introduction of the incandescent electric lamp in 1880 the consumption of platinum, not only in the United States, but also in Europe, has increased rapidly, although improvements made from time to time have greatly reduced the amount used in each lamp. In 1886-7 the Edison 16-C. P. lamp contained one grain, and the Sawyer-Mann lamp two grains; at present the Edison lamp contains but one-seventh of a grain, and the new Sawyer-Mann lamp none at all. In England the Edison-Berliner lamp, and in Germany the Siemens-Halske lamp have likewise had the amount of platinum reduced to a minimum, owing, as in this country, to the use of a shorter wire of a smaller diameter. Notwithstanding this, however, the gross amount of platinum used in this country and Europe in the manufacture of electric lamps has steadily increased from nothing in 1880 to about 55,000 oz. in 1892. If the new Sawyer Mann lamp should prove to be a success, of which, however, there is yet no proof, it might eventually replace all the other kinds of lamps now in use, and consequently this particular demand for platinum would cease.

On the other hand, however, it is to be observed that all the manufacturers of incandescent lamps have large plants already established, and that the amount of platinum used per lamp has been reduced to a minimum, so much so that its value forms less than five per cent. of the value of the lamp. Consequently it is quite probable that platinum will continue to be used in electric lamps, and that the amount so used will continue to increase with the growth of the industry.

There are, moreover, two other uses for platinum, which are even more important than its use in electric lighting, namely, the construction of stills for the concentration of sulphuric acid and the wires by which artificial teeth are firmly fastened to a plate. The amount used for stills varies widely from year to year, being greatly dependent upon the number of new plants started each year, but it has been estimated that the average amount so used during the last few years is about 80,000 oz. The manufacture of sulphuric acid is bound to increase, and although glas

concentrating vessels are now being used to some extent, it is believed that this industry will continue to supply a constantly increasing demand for platinum.

For dental purposes platinum will always continue to be used, being the only metal which possesses the required properties of infusibility, ductility and strength. In the United States 35,000 oz. and in England 25,000 oz. are annually used in this industry, and this amount will probably increase at the rate of two or three per cent. per annum.

The other uses of platinum, such as chemists' crucibles, jewelry, plating, etc., consume about 20,000 oz. annually, making the entire consumption about 215,000 oz., or 6,680 kilos. Of this amount from 30 to 40 per cent. is old or scrap platinum, which leaves from 4,000 to 4,676 kilos to be annually supplied by the mines.

For many years the Siberian Urals have supplied the greater part (92 per cent.) of all the platinum used in the world, but it is questionable whether its output can be maintained at its present high level for many years. According to the official statistics of the Russian Department of mines, the output of platinum in that country reached its maximum, 4,400 kilos, in 1887, following which it dropped to 2,700 kilos, and so remained until 1891 when, owing to the abnormally high price of the metal, the production amounted to 4,226 kilos. Many of the old placers are now worked out, and it is believed that the above figure represents the maximum possible output of the country. If then, the demand should continue to increase, as seems possible, it will be necessary to look for other supplies of the metal. Next to Russia the most important sources of platinum, so far as known, are Colombia, British Columbia and the United States.

At present Colombia produces but 125 kilos of platinum per annum, entirely the result of native washing. The platiniferous area, although of low grade, is, however, quite extensive, and in part suitable for hydraulic mining. A considerable amount of American capital has already been invested there, and it is quite probable that Colombia will become an important producer of the metal. The only platinum deposits of importance in British Columbia are found on the Talameen River. Recently a company has been formed to hydraulic these gravels, but so far the output has been small. The total production of British Columbia is about 65 kilos.

In the United States much prospecting has been done to find platinum in paying quantities, but so far without success, and up to the present time all the platinum produced has been incidental to the production of gold from various auriferous gravels in California and Oregon. If the laws prohibiting hydraulic mining in California should be repealed, that State may become a more important producer of platinum.

BOOKS RECEIVED.

In sending books for notice, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supersede review in another page of the Journal.

Triangular Surveys from Single Stations. By Augustus Knudsen, C. E., San Francisco: Burnt & Co. Price $1.

NEW PUBLICATIONS.

"SMALL TALK ABOUT BUSINESS." By A. E. Rice. The Fremont Publishing Company, Fremont, O., 60 pages. Paper, 40 cents; cloth, 75 cents.

In this unpretentious work many important business facts are treated in a clear and simple manner. It is a book which will be of considerable value to women and the young, while the broad underlying principles cannot fail to interest matured business men.

ENGINE ROOM CHAT. By Robert Grimshaw, M. E. New York: The Practical Publishing Company. Price, $1.

This is one of the books that are not easy to criticise, or rather hardly deserve criticism. It is a collection of paragraphs on various subjects connected with the stationary engine which were originally written for various papers. They are in an easy, colloquial style; some of them have sharp points, others very dull ones, and some none at all that can be seen or felt. Most of them are good enough for casual use in the columns of a paper, but why they should be preserved in book form it is hard to see.

AN INTRODUCTION TO GEODETIC SURVEYING. By Mansfield Merriman, Ph.D., Professor of Civil Engineering in Lehigh University. New York: John Wiley & Sons. Price, $2.

Professor Merriman has divided his book into three parts. The first contains the essence of several lectures on the "Figure of the Earth," originally prepared as an introduction to a course of study in Geodesy, and includes, after a general definition of the subject, an account of the various theories in relation to the true figure of the earth and the methods adopted by different investigators to ascertain or at least to approximate it. It may be said of this part that to a mathematician there can be few studies more interesting than that of the long series of calculations and observations through which the latest conclusions have been reached and the conception of the earth as a geoid finally established.

The second part is also interesting to the mathematician, being a concise but clear exposition of the method of least squares, its principles and its uses in ascertaining and eliminating the errors which are inevitable in all human observations.

The third part gives a synopsis of the methods and computations required in the field work of precise triangulation, particularly in secondary geodetic work. The methods and principles here laid down in the various rules and formulas are illustrated by numerical examples and by problems given for the student. The three parts together are intended to form an introduction to the thorough study of the science of geodesy and especially to geodetic surveying.

It must not be supposed that geodesy is an easy study or one to be undertaken without preparation. The present work is certainly one, however, which would lead the methematical student to keep on in his course. Professor Merriman has always a clear style and a faculty of explanation which are excellent gifts to a writer, and in this case he has a mastery of and an interest in his work which are apparent throughout.

POOR'S DIRECTORY OF RAILWAY OFFICIALS AND MANUAL OF AMERICAN STREET RAILROADS. 1892. New York: H. V. & H. W. Poor.

"Poor's Manual" and its accompanying Directory long ago made themselves essential to all who have business with railroad companies or investments in their securities. The directory has lists of railroad directors, and, arranged under separate heads, of the officers of the financial, operating, roadway, mechanical and traffic departments. The essential quality of a book of this kind is accuracy, and long use of the successive volumes has proved that great care is taken in their preparation, and while some errors are inevitable they are really very few in number. The only improvement that suggests itself is the issue of a quarterly supplement giving the changes which are constantly occurring in the "personnel" of our railroads.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents

The Discovery of Bauxite in Alabama.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: In my paper on Alabama bauxite and in your abstract of it, given in the Journal of December 17th, 1892, credit is given to Mr. J. R. Trotter, from what he told me, for the first discovery of bauxite in Alabama. He said that his discovery was in Cherokee County, and that it dated back to the spring of 1890. Mr. R. Swain Perry now writes that he wishes to claim and obtain recognition for the first discovery and identification of bauxite in Alabama. He says that he first discovered it in April or May, 1890, and his discovery was in Calhoun and not in Cherokee County.

UNIVERSITY, ALABAMA, February 22d, 1893. HENRY MCCALLEY.

Analysis of Ferro-Silicon and Silicious Spiegel.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Your issue of February 11th contains an abstract of an article from the "Chemical News," on the analysis of ferro silicon and silicious spiegel. Mr. T. W. Hogg, the author, proposes to treat the metal with nitro-hydrochloric acid, filter off the insoluble silica and evaporate the filtrate to dryness to obtain that which has gone into solution. "For works purposes" he deems it sufficiently accurate to estimate this dissolved silica.

A better method than either of these is to evaporate the nitro-hydrochloric solution to a sirup and then, by adding a few drops of powerful sulphuric acid (obtained by dissolving the anhydrous in the ordinary concentrated), under all of the silica insolubles, destroy the chlorides and nitrates, and have the iron as soluble sulphate. The many advantages of this procedure must be at once apparent.

BUFFALO, N. Y., February 16th, 1893. CHARLES PLATT

The Crawford Crushing and Amalgamating Mill.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: If the reports of results obtained at the Powhatan mine in Culpepper County, Va., as published by the Mechanical Gold Extractor Company, can be believed, the Crawford mill will be a great aid in treating the pyritic gold ores so common in the South. So far, however, I have heard of favorable results from the vendors of this machine alone. From parties who have given the machine a trial I have heard, however, of cases of absolute failure. Such a case is the experiment made on ore from El Oro, Durango, Mex., by the Lustre Mining Company, of Pittsburg, under the supervision of one of the Mechanical Gold Extractor Company's expert mill men.

Previous to mining the mill was charged with 170 lbs. of quicksilver, and then 43·77 tons of ore assaying $14 per ton were run through. The clean-up resulted in obtaining 59 lbs. of quicksilver; 111 lbs. had been lost in obtaining 3 oz. 12 dwt. of gold valued at $56. The rest had evidently flowed away with the tailings. The ore treated was pyritic and now the machine is being tested on free milling ore.

I should like to have some definite and authentic information from the Powhatan mine, but at present I do not think I shall adopt the process however flattering the prospectus of the company.

NEW YORK, February 20th, 1893. T.

Simon-Carves Coke Ovens with Recovery of Bye Products.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Your contemporary, the "Journal of Gaslighting," of London, has some correspondence interesting to coalowners and ironmakers from Mr. A. L. Steavenson, of Durham, on the above subject; also quoting Mr. F. P. Dewey to substantiate, if possible, his charges against the quality of our coke. This is not the first time Mr. Steavenson has expressed his bias against close oven coke, although I am not aware that he has ever had any great personal experience of its manufacture or its use on a considerable scale.

It is only fair to Mr. Henry Simon, of Manchester, who introduced the Simon-Carves ovens into this country, that the following facts should be known:

1. Coke made in similar ovens to the Simon-Carves ovens is almost universally used in Silesia, Westphalia, to a large extent in France, Belgium, Spain (in the latter country with Durham coal), Austria and other countries, and in each district the number of ovens is increasing.

2. Messrs. Pease & Partners, of Darlington, were the first English cokemakers to put down an installation of these ovens, in the year 1881; since then so successful have they proved that they have four times increased that number.

3. The Bearpark Coal and Coke Company, Durham; Macalpine, of the Altham Collieries, Whinney Hill; Wedgewood, of the Bignall Hill Collieries, Newcastle; and now the Middlefield Coal and Lime Company, Leeds, have each a number of Simon-Carves ovens working most satisfactorily and disposing without any difficulty of the coke and the bye-products they produce.

4. We are at present building 70 ovens on the same lines at Lanchester, near Durham, and Mr. Simon and Mr. Carves, together with Colonel Sadler, own almost the entire share capital.

This does not look like want of confidence, and, notwithstanding, the prejudice of some, we believe that this class of coke will be the fuel of the future for iron smelting, for the simple reason that it will be the cheapest; and this, we think, has been conclusively proved on the Continent and elsewhere. Notwithstanding all statements to the contrary, the fact remains that continental ironmakers use less of this coke per ton of iron made than do English ironmakers of beehive coke. As I can substantiate this statement it is not necessary for me to say anything about the density, porosity, or superficial appearance of our coke, concerning which Mr. Steavenson has so much to say.

Surely it is not at all a question whether a certain coke is the most perfect coke imaginable in every respect, but whether a coke, possibly not entirely corresponding to this ideal, can be made so much cheaper that the advantages of its use overbalance any possibly small drawback.

LANCHESTER, DURHAM, February 9th. W. SCHROLLER, M. Inst. Mech. E.

The Use of Burnt Lime in Lead Blast Furnaces.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: In reading Mr. H. O. Hofman's valuable work, "The Metallurgy of Lead," I noticed the following remarks in regard to the use of burnt lime in place of unburned lime rock. On page 141 he says: "Burnt lime is rarely, if ever, used in the blast furnace," and again on page 238 I find this statement: "The writer is not aware that caustic lime is used in any lead furnace. It would seem as if the lime being exposed during its descent in the furnace to gases rich in carbonic acid would be converted quickly into carbonate of lime in the upper part of the furnace and lose any decomposing power again."

Now for the benefit of a few who have written to ask me how I like the action of burnt lime in the furnace I will state that after nine years' experience with it I find it acts very much as Mr. Guyard suggests (see Hofman's "Metallurgy of Lead," page 238).

We have been using burnt lime nearly altogether for over eight years and find that it has the following advantages:

1. It requires no crushing or sledging and can be wheeled direct from the car it arrives in to the charge scales. 2. The furnaces keep open better, make clean slag and less accretions form on the sides of the furnace. 3. More ore can be smelted with the same labor and fuel than can be smelted with lime rock at less cost—e. g., We will suppose a 1,000-lb. charge is to be used, and we require 150 lbs., CaO., net, and are using lime rock analyzing CaO 53·86, SiO_2 1%. Net CaO would be 52% and the charge would be 712 lbs. of ore and 288 lbs. of rock.

Now if we were going to use the same lime burnt it would have about the following analysis: CaO, 96·72; SiO_2, 2%, and the net CaO would be 93%. A 1,000-lb. charge would be as follows: 839 lbs. of ore and 161 lbs. of burnt lime, showing that 127 lbs. more ore can be smelted in each charge with lime burnt than when not burnt with the same labor and fuel at the furnace and no crushing outside. Any one knowing how many charges his furnace has made can multiply the number by 127 lbs. of ore and that by the treatment charges they receive for smelting and find out how much more he has saved to pay the difference between the cost of lime rock and burnt lime. The greater the distance the lime has to be hauled to the smelter the more saving there is on account of freight.

Although we have been using burnt lime here at the American smelter for more than eight years, for business reasons there has been very little said about it, but a few years ago the Holden smelter, at Leadville, made a large contract for burnt lime and is using it in place of lime rock. I understand that other smelters in the valley have now started to replace lime rock with burnt lime.

The idea first suggested itself to me in the summer of 1882. I then had charge of a small smelter, and at one time before that had experimented with lime in place of potash in assaying.

LEADVILLE, Colo., Feb. 21, 1893. S. E. BRETHERTON.

The Persistence of Lodes in Depth.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I have read with interest the contributions of Professor Blake and Mr. T. A. Rickard on the above subject in recent issues of your journal. While agreeing in the main with Mr. Rickard's arguments, and completely sharing his dislike for the silly stock-phrase current as to "increasing richness in depth," I must demur when he goes on to state: "It is a notorious fact, the recognition of which is avoided, that the deep mines of that district, around Carnbrea and Redruth, are much poorer now than they were at shallower depths."

With your permission I will give a brief summary of the facts for the benefit of such of your readers as may not be familiar with the district in question.

The Carnbrea-Redruth, or as it would perhaps be better described, Carnbrea-Illogan, district (which, it must be borne in mind, is only one out of the many distinct mining districts in Cornwall), is of comparatively recent date—less than 50 years—as an important producer of tin; nearly all the principal mines having been originally copper mines, either working on other lodes, or producing copper from lodes in which it has in depth given place to tin. The present output of tin is greater in value than that of copper ever was.

Taking the output of the principal mines I find that on the whole they have shown continuous progress ever since they became producers.

There are, of course, fluctuations, and one or two exceptions, while a few mines have fallen out of the running; but the general result is as stated. It is naturally difficult to ascertain to what extent this is due to increased richness of yield, as so few definite figures of yield over a fair period are obtainable. That there has been an increase of richness in depth at Dolcoath is, perhaps, sufficiently indicated by the fact that a few years ago the output from the three lowest levels averaged 8% black tin, whereas that from the whole mine averaged only 3%—a difference which the recent great discoveries in the bottom are hardly likely to have made less apparent. Mr. Rickard, however, admits Dolcoath to be an exception to what he thinks the general rule. I therefore give the following comparative figures of yield at the other mines on the Dolcoath main ("Highburrow") lode:

	1872 to 1881 (R. J. Frecheville).	Present yield.	
Carnbrea	35 lbs. per ton.	60 to 70 lbs. per ton.	
Cook's Kitchen	43 " "	49 " "	
Tincroft	53 " "	60 " "	(probably)

These then to a considerable extent support the Dolcoath experience—Dolcoath, it must be remembered, being the deepest mine. The comparison at Carnbrea would be more striking but that the lode has been lost underneath the great shoot cut two or three years ago in the then bottom level.

The other main tin bearing lode of the district is the Flat Lode, extending from Wheal Grenville to Wheal Uny. While there is here perhaps no distinct evidence of increased richness in depth, there is certainly no sign of a tendency the other way. The Flat Lode is little known at the higher levels, having only been worked after the falling price of copper forced the mines to turn their attention to tin.

While, therefore, experience in other districts, pointing quite as distinctly in the other direction, may lead us to question the existence of any general rule that lodes increase in richness with depth, it is no use shutting our eyes to the facts in this particular case.

Before concluding I will briefly state the general conclusions indicated by experience in this district—conclusions which I think are accepted by all competent observers familiar with the facts: 1. The lodes of the district were never rich for tin near the surface. 2. They show, as a whole, no sign of a falling off in richness with depth. 3. The mines on the Dolcoath main ("Highburrow") lode show a general tendency to increase productiveness in depth. 4. These mines show a replacement of copper by tin in depth. 5. This change roughly corresponds with the change in the country rock from killas to granite.

LONDON, February 8th, 1893. GEORGE E. COLLINS.

Mineral Exports of Newfoundland.—According to official statistics just issued the mineral exports of Newfoundland during 1891 were as follows: Copper ore, 7,060 tons, value, $63,540; regulus, 3,626 tons, and ingots, 1,139 tons, value of both, $502,510; iron pyrites, 19,150 tons, value, $57,900; antimony, $1,000. The total value of ores exported in 1891 was $624,750. From 1854 to 1891 the total value of copper ore exported was $9,193,790; the total value of all ores exported in that period being $9,594,717.

Storing Steam Heat.—As is well known, the duty of electric light engines and boilers is the most irregular of any mechanical installation. The demand for electric light exists at its maximum for only six hours out of every twenty-four, and it also varies throughout the year. Occasionally an atmospheric disturbance such as a fog or rainstorm creates a sudden and excessive demand for light, and the meeting of such a demand causes a very great strain on the plant. It is, therefore, more necessary than in any other steam generating plant to have a great number of quick raisers of steam. This means a large outlay of capital on machinery that is only in use a quarter of the time to meet a very temporary maximum requirement. The quick raisers of steam are also very wasteful of fuel. There is no satisfactory method for equalizing the load on the engines and boilers in electric light stations. Storage batteries have been used, but they can only be used with direct currents, and they are enormously expensive in first cost, repairs and attention. Another method is to drive the dynamos by means of gas and petroleum engines. This system is used with success in England, but is comparatively unknown here. The latest suggestion is by Mr. Halpin, of London, who proposes to use boilers and engines, but to store heat during the day in specially constructed reservoirs. As the water in the boilers is raised to 250 lbs. pressure it is conducted to cylindrical reservoirs resembling English horizontal boilers and stored there for use when wanted. In this way a comparatively small boiler plant can be used for heating the water to 250 lbs. pressure all through the twenty-four hours of the day, and the stored water may be drawn on at any time according to the magnitude of the demand. The steam engines are to be worked by the steam generated by the release of pressure from this water, and the valves are to be arranged in such a way that the steam shall work at 130 lbs. pressure. Professor Unwin, in commenting on this scheme, speaks favorably of it. He says that a reservoir 8 ft. in diameter and 30 ft. long, containing 84,000 lbs. of heated water at 250 lbs. pressure, would supply 5,250 lbs. of steam at 130 lbs. pressure. As the steam consumption of a condensing electric light engine is about 18 lbs. per horse-power hour, such a reservoir would supply 286 effective horse-power hours. The cost of storage plant would only be $8 per horse-power hour as compared with $40 with secondary batteries. In 1878, in France, this method of storing steam was used on a tramway. M. Francq, the engineer to the tramway, designed a smokeless locomotive to work by steam power supplied by a reservoir containing 400 gallons of water at 220 lbs. pressure. The reservoir was charged with steam from a stationary boiler at one end of the tramway.

THE COAL FIELDS OF MONTANA.—III.*

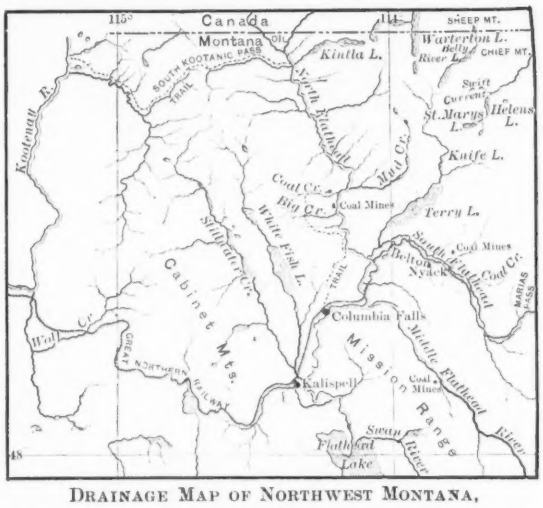
Written for the Engineering and Mining Journal, by Walter Harvey Weed, E. M.

THE SWEET GRASS HILLS AND THE FLATHEAD VALLEY.

In two previous papers, an account has been given of the coal mines of the State of Montana, situated in the great belt of coal land that lies upon the eastern flanks of the Rocky Mountains, stretching along the front of the range from the Wyoming line to the Canadian border.

Since the publication of these articles, the extreme northwestern part of the State has been visited, and found to possess features of interest to the practical miner.

The far northwestern part of Montana embraces portions of the two great geographic divisions into which the State is divided; the great plains, and the Rocky Mountain region. The plains in the vicinity of the Marias River form a very flat or but gently rolling prairie land, without trees or shrubs, generally well grassed, and traversed by sluggish streams flowing in cuts whose cliffs expose the edges of the



DRAINAGE MAP OF NORTHWEST MONTANA,

horizontal beds of sandstone and shales that underlie the country. Frequently the dark outcrop of a coal seam is seen in these exposures, but throughout this prairie country the coals have so far proven poor and of little value under present economic conditions. This region is a continuation southward of that horizon of the Cretaceous rocks, called by the Canadians the Belly River formation, from which the mines of Lethbridge derive their supply.

The plains are broken near the Canadian line by a very striking group of peaks, rising abruptly from the prairie, forming one of the famous landmarks of the region, and known as the Three Buttes, or Sweet Grass hills. These hills are the denuded roots of extinct

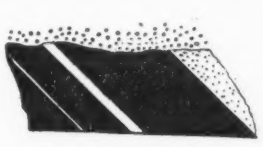


FIG. 2.

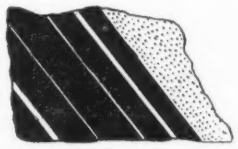


FIG. 3.

volcanoes, whose cones have long since disappeared. Upon their flanks the coal-bearing strata are inclined at steep angles, dipping away from the peaks. Recent prospecting has shown the presence of two seams of coal here, one regarded generally as the equivalent of the Lethbridge seam, the other a fuel of excellent quality, well jointed, breaking readily into blocks, and which, though overlaid by a poor roof, can be cheaply mined. An analysis of this coal made for me in the laboratory of the U. S. Geological Survey showed the following percentages: Moisture, 11·62; volatile carbon, 37·16; fixed carbon, 46·57; ash, 4·69.

The percentage of moisture is quite high, but the sample was not taken under good cover. The ash is low and the carbon percentages, the same as the best Montana coals.

West of the prairie region, the mural front of the Rocky Mountains rises quite abruptly, sharply defining the eastern limits of the Cordilleran region. This precipitous wall, is broken by but few passes to the country to the westward, the best known being the Marias pass. Through this the Great Northern railway, has been built, on its way to the Pacific Coast, penetrating an almost unknown mountain region, and opening to settlement the fertile valleys, and timber lands of the Flathead lake country.

In this mountain region coal seams have been found that have been supposed to be the southward extension of the famous Crow Nest coals of Canada. The mountainous area lying between the plains and the broad valley of Flathead Lake to the west consists of a western range, known as the Kootanai Mountains, separated from the wilderness of peaks to the east by the long valley of the north and south Flathead Rivers, streams that unite and break through the mountains near the north end of Flathead Lake. This intermontane valley, continuous from far into Canadian territory, down the entire length of the north Flathead, and up the south Flathead an equal distance, is largely underlaid by coal-bearing rocks. Owing to a heavy mantling of glacial gravels and drift, and the abundant vegetation of ferns, and shrubby undergrowths, which the moist climate fosters, exposures of the coal seams must be looked for along the streams, whose clear waters reveal at once the outcrops.

Coal has been also found in the mountainous region east of this valley, but the only workable seams thus far discovered, are located in the valleys of the Flathead rivers. A recent examination of this region by the writer shows a considerable area of coal land, much of it as yet not located. The strata hold a large number of seams, of which the coals so far opened are of a quality much in demand.

The drainage map of the region, reproduced herewith, shows the location of the coal openings and the line of the railroad. At present these locations are accessible only by trails, through the dense forests of the region, the nearest openings on the North Flathead River being some thirty or more miles distant from Columbia Falls, and Kalispell. A brief account of these particular openings has already appeared in this journal. The rocks at Coal Creek consist of soft, silty sandstones, shales, and clays, resting upon the red quartzites of probable triassic age that form the mountains west of the valley. The coal-bearing strata dip eastward, with the slope, at 45°-55°. The upturned edges of the coal rocks are covered by gravels forming the broad valley terrace, this alluvial drift being frequently 300 ft. in thickness. These facts make it difficult to obtain samples under good cover, and will make the working of the seams at this vicinity an expensive matter, and mining would be below the water level. At the so-called coal banks two short drifts have been driven in on the seam, but as the openings show only the exposed edges of the seam, with the gravels resting upon the coal, no good samples are obtainable. The sections of the two seams opened here are shown in Figs. 2 and 3. The roof rock is a soft clayey sandstone, which will, however, probably improve if better cover is obtained. Following up the creek above the openings the outcrops of six other seams can be seen either in cross trenches dug in the creek banks, or visible in the creek bed, but nothing is known of their value. A couple of miles southeast along the strike of the seams of Coal Creek brings one to the banks of the Flathead River, where an entry some 150 ft. in length, known as the Emerson tunnel, has been driven across the seams. A carefully measured cross section of the beds cut by this drift is represented in Fig. 4. The coal from these seams is similar in nature to that of the Coal Creek openings, firm, compact, and bright, and promising to be a valuable fuel. Like the Coal Creek locations this is, however, a poor point to develop mining operations. No attempt seems to have been made to trace the coal across the river, where good cover is more probably obtainable. The other prospects of the North Flathead River are similar in character to those just noted, and show a large area of coal land.

The valley of the South Flathead River presents the same general features as its northern extension. Thick deposits of river gravel and glacial drift conceal the rocks, but samples from the prospect pits, some 30 miles south of the railroad, show coals somewhat inferior in quality to those of Coal Creek, though similar in character. As the trail to this region is very poor, but little prospecting has as yet been done, but the locality could be readily reached by a branch line of the railroad if the coals should prove valuable.

An examination of the coal prospects of the middle fork of the Flathead showed the presence of an area of coal land contiguous to the railroad, near Nyack. The coal seams opened are too thin to work, but

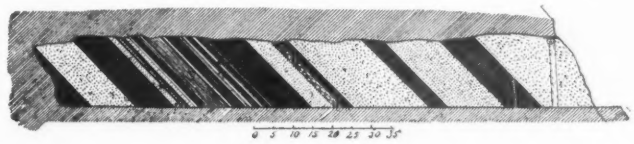


FIG. 4.

intelligent prospecting at a different horizon will probably show the presence of other seams. It is certainly a promising part of the field to prospect on account of its nearness to the railroad. The sandstones of the coal-bearing strata furnish an easily dressed building stone, already used by the towns of Kalispell and Columbia Falls.

The age of the coal-bearing strata of this region is a question of some little interest, as it is to determine whether these coals are the equivalents of the excellent fuels found to the northward of the Canadian line. Though generally barren of fossils the sandstones of this series exposed near Nyack contain an abundance of fossil shell remains, mostly indeterminable, but holding tertiary species, which would preclude the idea of these being Kootanai (lower Cretaceous) age.

* Previous papers on this subject will be found in the ENGINEERING AND MINING JOURNAL for May 14 and 21, 1892.

The Assay Commission appointed by the President on the 1st ult. will make the annual test of the coins coined at the various mints during the year. It is of course a physical impossibility for every coin manufactured to be examined by the body, so that the law requires that at every delivery of coins pieces shall be taken indiscriminately therefrom, which are sealed up and set aside until assay day comes when they are closely examined. The coiners of the mints are allowed a percentage of loss or gain of 1½ grains on silver and ½ grain on gold pieces. The Commissioners are always representative men, being citizens who stand highest in their several communities. This year it is expected that Secretary of the Treasury Foster will be present. The board this year is made up as follows: Prof. E. B. Andrews, Rhode Island; George Wilson, New York; Dr. P. B. Wilson, Maryland; W. F. James, Utah; Thomas Dolan, Philadelphia; Israel Lawton, California; John H. Deshler, Ohio; Cabell Whitehead, Virginia; S. M. Stay, Wisconsin; J. W. Cunningham, Idaho; Hon. Andrew P. Wiswell, Maine; D. N. Foster, Indiana; A. Jones, Illinois; John G. Long, Florida; Horace Ruller, Wisconsin; Hon. William Butler, Pennsylvania; A. Barton Hepburn, Comptroller of the Currency; Prof. H. G. Torrey, New York. The Commission will be in session about three days. W. E. Morgan, of the Directors' Department at Washington will be the Secretary.

VALENTINE'S ESTIMATE OF THE PRODUCTION OF METALS IN 1892.

The statistics compiled by John J. Valentine, president of Wells, Fargo & Company, relative to the production of the precious metals and copper and lead, show that the States and Territories west of the Rocky Mountains, including British Columbia, produced in the aggregate: Gold, $30,119,636; silver, $50,607,601; copper, $19,370,516; lead, $11,433,947. Total gross result, $111,531,700. The "commercial" value at which the several metals named herein have been estimated is: Silver, 87 cts. per oz.; copper, 12 cts. per lb., and lead, $4.10 per cwt.

As in former reports allowance must be made for probable variations from exact figures, by reason of constantly increasing facilities for transporting bullion, ores and base metals from the mines outside of the express, and the difficulty of getting entirely reliable data from private sources. Estimates attained in this way are liable to be exaggerated and are, to a degree, guess work; but with some modifications on this account, made herein, the general results reached, while only approximately correct, may be accepted as the closest approximation possible under the circumstances.

STATES AND TERRITORIES.	Gold dust and bullion by express.	Gold dust and bullion by other conveyances.	Silver bullion by express.	Ores and base bullion by freight.	Total.
California	$8,961,486	$1,400,000	$351,139	$885,571	$11,598,196
Nevada	1,378,381	.....	2,632,431	1,403,350	5,414,162
Oregon	945,886	75,000	115,140	.....	1,136,295
Washington	237,208	25,000	150,000	.....	412,208
Alaska	.....	785,000	.....	.....	785,000
Idaho	1,790,100	.....	2,434,260	2,536,875	6,761,235
Montana	2,875,000	.....	13,650,000	14,386,673	30,911,673
Utah	23,791	.....	1,583,677	11,139,888	12,547,356
Colorado	4,743,503	.....	19,984,859	4,472,627	29,200,989
New Mexico	357,820	125,000	114,718	1,639,950	2,237,488
Arizona	787,555	215,000	287,426	5,492,276	6,782,607
Dakota	2,955,578	.....	230,000	18,000	3,203,578
Texas	.....	.....	268,740	.....	268,740
British Columbia	272,192	.....	.....	.....	272,192
Total	$25,328,450	$2,625,000	$41,612,640	$41,975,610	$111,531,700

The following table shows the net products of the States and Territories west of the Missouri River, exclusive of British Columbia and west coast of Mexico during the past four years:

Year.	Lead.	Copper.	Silver.	Gold.
1889	14,593,323	14,793,763	64,868,637	32,537,661
1890	11,509,571	20,569,092	62,930,831	31,795,361
1891	12,385,780	13,261,963	59,614,404	31,665,418
1892	11,433,947	19,370,516	50,607,601	29,847,414

The exports of silver during the past year to Japan, China, the Straits, etc., have been as follows: From London, $54,226,465; from San Francisco, $13,116,059; total, $67,342,524, as against $41,379,445 last year. Pounds sterling estimated at $4.84.

The gross yield for 1892, shown above, segregated, is approximately as follows:

Gold	27 1/100	$30,119,636
Silver	45 7/100	50,607,601
Copper	17 3/100	19,370,516
Lead	10 23/100	11,433,947
Total		$111,531,700

The following is a statement of the product of the Republic of Mexico during 1889, 1890, 1891, values upon mintage basis.

Year.	Gold.	Silver.	Total.
1889-1890	1,100,000	41,500,000	42,600,000
1890-1891	1,150,000	43,000,000	44,150,000
1891-1892	1,275,000	45,750,000	47,025,000

The returns from Mexico continue to show a steady forward movement in full accord with the healthy progress of mineral developments and mining interests in the United States. This result is owing, in great measure, to liberal and friendly policy of the federal government of Mexico, which has afforded enterprises of the kind every reasonable encouragement. The prospects for the future are also very bright.

ABSTRACTS OF OFFICIAL REPORTS.

MARYLAND COAL COMPANY.

The annual report shows net profits of $96,948, out of which was paid $94,500 in dividends; balance carried to profit and loss, $2,448. Shipments during the year were 286,213 tons, against 406,464 tons in 1891, a decrease of 120,251, caused by inability of the Pennsylvania Railroad to transport the coal. The company paid off $20,000 of its first mortgage bonds during the year, leaving total bonded indebtedness now $100,000.

HORN SILVER MINING COMPANY.

During the year 1892 there were 21,094 tons of ore extracted from the mine, every level from the first to the tenth yielding a part of this product. Up to December 1st the principal part of the ore was sent to the Philadelphia Smelting and Refining Company, at Pueblo, Colo.; since then a contract has been made with the Germania Smelting and Refining Company, of Murray, Utah.

During the year shaft No. 5 was sunk 269 ft.; a winze was sunk from the second level 100 ft., and the different drifts were extended a total of 1,442 ft.

The cost of ore extraction was $60,848; dead-work, $26,335; surface labor, $21,841; supplies, $33,084; total, $141,108. The average cost per ton of ore was: Extraction, $2.885; dead-work, $1.248; surface labor, $1.035; supplies, $1.569; total, $6.737. The average value per ton of ore was $15.295.

This does not include output from the caved ground near the surface, where 2,839 tons of ore was taken out at a total cost of $15.107, or $5.324 per ton. This ore produced $69,455, or an average of $24.48 per ton.,

The 700 north drift was connected with shaft No. 5 on October 4th. Shaft No. 5 is 1,273 ft. north from the main shaft. This drift is now extended nearly 200 ft. north from shaft No. 5, and is still being extended with fair prospect for pay ore. The title to this ground is perfected, patent having been recently issued. The indications for ore are also good in the 1,100 north drift. There is almost an unlimited amount of low grade ore in the mine that can be made profitable by concentration, the only question being the water supply. The manager believes, however, that sufficient water may be had in the immediate vicinity to concentrate a good portion of this product. Steps have already been taken to demonstrate this.

The financial report shows total receipts for ore sales, $377,026; interest and miscellaneous, $24,338; total, $401,364. Mine expenses were, $171,066; office and general expenses, $28,918; total, $199,984; leaving a balance of $201,380. Dividends amounting to $200,000 were paid, leaving a balance of $1,380, which, added to the surplus at the beginning of the year, left a cash balance of $276,684 to be carried to the new year.

CONSOLIDATION COAL COMPANY.

The report for the year ending December 31st, 1892, shows gross receipts from mines, railroad, rents, etc., including value of stock of coal on hand, of $2,424,794; total expenses, exclusive of interest, including 307 tons of heavy steel rails and all extraordinary outlays, $2,079,776; net receipts, $354,217; interest on funded debt, $116,900; leaving a balance to the credit of profit and loss of $237,317 which, with the balance of the previous year, left a balance of $328,824. From this was paid in February, 1893, $205,000 in dividends, and $47,104 carried to the royalty fund, leaving a net balance of $76,720.

During the year the company mined and delivered from its own mines 938,695 tons of coal, against 910,977 in 1891, an increase of 27,718 tons. There were transported on all the company's railroads 2,216,647 tons, against 2,390,929 tons in 1891, a decrease of 174,282 tons. The report states that it is expected to increase the output capacity of the company to 4,500 tons daily. The product of the Cumberland coal field since 1842 has aggregated 68,908,935 tons, and that of the Consolidation Coal Company since its organization in 1864, 15,179,114 tons. The output of the Cumberland field in 1892 was 3,058,350 tons, of which 30·7% was furnished by the company's mines.

LEHIGH COAL AND NAVIGATION COMPANY.

The seventy-second annual report of the Lehigh Coal and Navigation Company has been issued. The total revenue for 1892 was $2,224,711.52. Of this $1,230,067.85 was appropriated for general expenses, rentals, taxes and interest, leaving surplus earnings of $994,643.67. Out of this sum $90,857.50 was set aside for the coal sinking fund, $50,058.57 for the depreciation of coal improvements, and $789,065.75 for the payment of two dividends upon the capital stock, one of 2½% and one of 3%. The revenue of the company was derived from these sources: Lehigh & Susquehanna Railroad, $1,674,074.18; other railroads, $71,399.45; canals, $31,343.61; Lehigh coal lands, $343,077.24; miscellaneous receipts, $104,817.04. The disbursements were: General and legal expenses, $63,398.73; rental of leased properties, $177,382.43; taxes, $136,823.42; interest account, $852,463.27; dividends, $789,065.75. The balance on hand was stated to be $55,661.85. The coal traffic of the Lehigh & Susquehanna Railroad and Lehigh Canal was 5,569,622 tons for 1892, against 6,196,051 tons for 1891, a decrease of 626,492 tons. The report also said: "The revenue from coal was satisfactory, being the largest since 1888. The gain over 1891 in this department was all made in the latter half of the year, as the improved condition of the coal trade did not greatly affect the prices realized for coal before July."

HECLA CONSOLIDATED MINING COMPANY.

The twelfth annual report of this company shows that in 1892, in spite of the low price of silver and the impoverished condition of the mine, a profit amounting to $57,277.40 was earned, and from this and the reserve funds dividends to the extent of $90,000 were declared. The manager of the property, which is situated in Beaverhead County, Mont., Mr. H. Knippenberg, states in positive terms that there is little paying ore in sight, but that he has faith in the results of vigorous prospecting.

During the year 6,310 net tons of first class ore were furnished the smelter, the average contents of which were 36% silica, 23 35-100% lead and 45 61-100 oz. silica per ton; and 13,450 tons were sent to the concentrator, which were concentrated in the proportions of 1 to 8, yielding 1,683 8-10 tons of concentrates, which assayed 14 34-100% silica, 35 85-100% and 50 2-10 oz. silver per ton. On October 10th, 1892, shipments of ore were suspended; the concentrator had been closed down on September 13th.

The total cash income from all sources for the year was $408,654.63, and the total outlay, exclusive of dividends, was $351,377.23.

Expenses during the year amounted to $41.72 per ton of ore smelted, divided as follows:

Mining (including wood and timbers)		$16.
Concentrating		.
Smelting:		
Labor	$6.33	
Iron ore	1.20	
Charcoal	2.73	
Coke	4.04	
Lime rock	.28	
		14.58
Wagon transportation		4.94
General supplies		2.21
General expenses, taxes and insurance		2.26
Total		$41.72

The high cost of smelting is in part due to the cost of coke and iron ore, the latter of which formerly cost $8.66 per ton delivered at the works; various economies have brought this down to $6.25 a ton, however. The mining costs, if the second class or concentrating ore was taken into consideration, amounted to $7.16.

The concentrator ran 215½ shifts of 12 hours, and treated 13,450 tons of ore at a cost of 47½ cents per ton of crude ore and $3.80 per ton of concentrates. The tailings pile at the concentrator contains 75,000 to 100,000 tons, assaying perhaps 10 oz. silver per ton. Mr. Knippenberg believes that these will be utilized at some future time.

GEOLOGICAL OCCURRENCE OF THE BROKEN HILL ORE DEPOSITS.*

By E. F. Pittman, A. R. S. M.

The Broken Hill ore deposits do not occur in an ordinary true fissure lode, but should be referred to what are called segregated lodes, of the type known in the Bendigo District as saddles, although they differ from the Bendigo saddle reefs in dimensions, in metalliferous contents and in the character of the gangue. The Broken Hill lode is argentiferous, though containing some gold, and consists at and near the surface of manganiferous ironstone, which below is replaced by kaolin and oxidized ores (carbonates) of lead, and at greater depths these are again replaced by sulphides of lead and zinc. The Bendigo saddle reefs are of auriferous quartz, with a small percentage of iron pyrites.

Nevertheless there are points of similarity between the two which may have some bearing on the probable persistence in depth of the Broken Hill ore deposits.

The difference (according to J. A. Phillips) between a true fissure vein and a segregated vein consists in the fact that the former occupies a fissure, cutting (in a direction which may be more or less oblique) across the bedding planes of the country rock, while the latter is deposited in a fissure formed between and parallel with the stratified beds; the ore, in fact, having filled the space caused by the forcing apart of two contiguous beds. The variety of segregated veins, so well known in Bendigo, as saddle reefs, and which, so far as I know, have not been hitherto recorded as occurring in any mining country except Victoria, differs from ordinary segregated lodes merely in the fact that instead of lying in one plane, they occupy space or fissures which, owing to the bending or contortions of the country rocks, have assumed somewhat the shape of an inverted trough, and in cross section have the appearance of a saddle—hence the name.

The country rock at Bendigo consists of highly contorted slates and sandstones which are of Lower Silurian age. The contortions of these slates and sandstones have assumed the forms of anticlines and synclines. If a quire of paper be placed flat upon a table and lateral pressure be exerted against the sides, it will be found to form saddles and troughs, or anticlines and synclines, corresponding with the contortions of the Bendigo rocks, which have in fact been produced in an

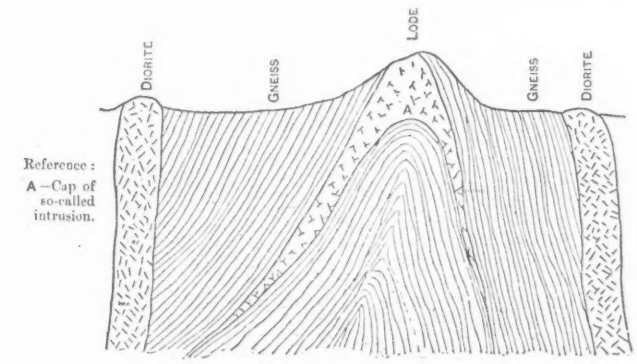


FIG. 2.—IDEAL SECTIONS OF BROKEN HILL.

analogous manner, and it will be noticed that spaces will be formed between the sheets of paper, more particularly at the upper parts of the anticlines and the lower parts of the synclines, corresponding exactly with the fissures in which the saddle reefs of Bendigo were deposited.

The reefs at Bendigo are associated with narrow intrusive dikes of dark gray dolerite, which have probably had some influence on their auriferous contents. While the legs of the saddles are found to thin out and disappear in depth, the permanance of the mines is assured by the certainty of other saddles being discovered, at greater or less distance, almost perpendicularly under the first.

The Broken Hill district is composed of similarly contorted rocks, consisting principally of crystalline gneisses passing into banded quartzites, micaceous and hornblendic schists and garnetiferous sandstones. Owing to the highly altered character of these rocks and the consequent absence of organic remains, it is difficult to determine their exact age. There are no dolerites in the neighborhood of the mines, but intrusive dikes of highly basic diorite are seen extending along both sides of the hill and more or less parallel to it. Broken Hill itself is composed of an anticline, the highest part of the ridge being occupied by the outcrop of the lode—a mass of manganiferous iron ore which has withstood denudation by reason of its hardness and compactness—while on the eastern and western slopes of the hill the gneissic rocks are found to be dipping east and west respectively. Below in the mines the lode is divided into two portions, one following the eastern dip, while the other and larger portion dips to the west. The depth at which the lode divides differs at various points. The rock which separates or divides the lode is locally referred to as the "horse" or the "intrusion," but both terms appear to be incorrect. The character of the rock shows that it has not fallen into the fissure and been subsequently surrounded by lodestuff, but that it is the country rock or footwall of the lode. In short, the foliations of this rock, which appear to coincide with its bedding planes, are clearly defined and indicate that it is the cup of an anticline, forming the lower walls of a saddle-shaped fissure which the lode has filled, and similar in formation to the curved beds of slate and sandstone which separate the legs of the saddle reefs at Bendigo.

It has already been stated that this so-called intrusion is found at materially different depths in the principal mines along Broken Hill, and herein is another point of similarity to the Bendigo saddle reefs, which rise near to the surface in some mines and descend to greater depths in others, owing to the fact that the country rocks in which the reefs occur are contorted into curves along their line of strike as well as in the transverse direction.

The Broken Hill lode, in short, appears to be a huge saddle lode, formed in a fissure which owed its shape to the contortions which the gneissic rocks have undergone. If this opinion be correct, the probability is that the eastern and western legs will be found to thin out gradually as they descend, and in that case the depth at which they would disappear would depend to a great extent upon the width of the synclinal basins on either side of the hill. The underground workings in Block 10 show that at a depth of over 600 ft. the western leg is still represented by a huge width of sulphide ores, so that the possibility of the lode thinning out is evidently not a matter for immediate alarm. What appears, however, to be the most interesting question is the possibility of similarly shaped lodes being found more or less vertically under the present one, as they are found to occur in Bendigo, and undoubtedly the best means of ascertaining this would be to put down diamond drill bores through the cap of the so-called intrusion.

The conclusions may be summarized as follows:

1. In several important respects the geological formation and origin of the Broken Hill lode and the saddle reefs of Bendigo appear to be analogous.
2. If this analogy hold, the eastern and western legs of the Broken Hill lode may be expected to thin out in depth.
3. There is a possibility of other similarly shaped lodes being found more or less vertically underneath the Broken Hill lode, and this could best be tested by putting down diamond drill bores through the cap of what is locally known as the "intrusion."

* From "Records of the Geological Survey of New South Wales," Part 2, 1892.

COMPOUND LOCOMOTIVES IN EXPRESS SERVICE.*

The Chicago, Burlington & Quincy Railroad Company has for some years been trying to secure engines which will do the work required on its through express trains over the first division of the road, from Chicago to Galesburg. The trains vary from 10 to 13 cars, or from 350 to 450 tons in weight; the distance is 163 miles, and the average speed required 40 to 45 miles an hour.

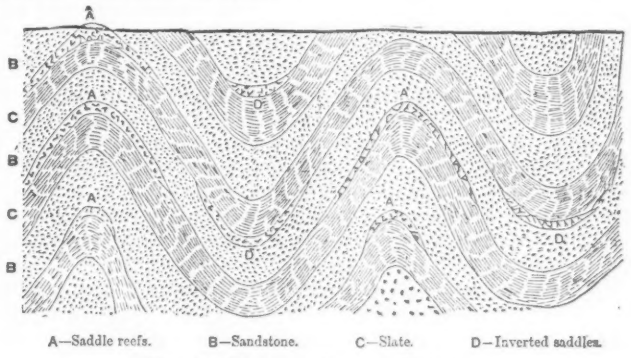


FIG. 1.—BENDIGO SADDLE REEFS.

With a view to a final decision of some disputed questions a test was recently arranged and carried out under supervision of Mr. C. H. Quercau, engineer of tests. In this test five engines were used, an eight-wheel engine with 18 × 24-in. cylinders and 69-in. drivers; a mogul engine with 19 × 24-in. cylinders and 62-in. drivers; a mogul of the same dimensions except that the drivers were 68 in. These three were simple engines. Two compound locomotives were included, the first a mogul of the same class as No. 3, except that, instead of the two cylinders of the same size, it had a high-pressure cylinder 20 × 24 and a low-pressure 29 × 24 in., with an intermediate receiver. The last was a Vauclain four-cylinder compound, having cylinders 14 and 24 × 24 in., 72-in. drivers and about one-third more heating surface than the other engines. The simple engines worked at an average of 160 lbs. pressure; the two compounds at 170 and 177 lbs., respectively.

The tests extended over seven round trips of each engine, and the points observed included fuel and water used; speed attained, and time required to start from a full stop. The results are given in the paper in a number of elaborate tables; the general conclusions reached are substantially as follows:

1. The coal measurements show 22% more tons of cars hauled per lb. of coal by the simple engines than by the Baldwin compound.
2. The average rate of evaporation was 5% more with the simple engines than with the Baldwin compound.
3. The cylinder performance measured by the indicator cards, taken at average running speed, 45 miles per hour, shows 18% more foot-pounds of work done per heat unit in the steam used by the simple engines than by the Baldwin compound.
4. At 30 miles per hour the cards show the Baldwin engine to have the best economy, developing 14% more work per heat unit than the simple engines.
5. The poor showing made by the Baldwin compound was largely due to the heavy train and high speed. With a lighter train, or the same train on a slower schedule, it would have shown a much better economy. The cards taken at 30 miles per hour show this.
6. The Baldwin compound engine, as operated on trains weighing 350 to 400 tons, was not as economical in the use of coal as the simple engines, by about 25%.
7. When worked in heavy express service, the Baldwin compound

* Abstract of paper read by Mr. William Forsyth at the October meeting of the Western Railway Club.

lost the principal advantages of compounding, namely: High initial pressure in the cylinders; increased number of expansions and softer blast on fire.

As a result its boiler performance and cylinder performance were not as good as simple engines of proper capacity.

It may be noted that the two-cylinder compound engine had, previous to these tests, shown a considerable economy as compared with simple engines of the same class in freight service and at speeds up to 20 and 25 miles an hour.

THE RELATION BETWEEN ORE DEPOSITS AND THEIR INCLOSING WALLS.

Written for the Engineering and Mining Journal by Harold W. Fairbanks, F. G. S. A.

A great deal has been said and written concerning the relation between ore deposits and their walls. The theories have been many, and no conclusions have yet been arrived at on which all can agree. This is due in part to the exceedingly complex conditions under which ores occur, and in part to the standpoint of the individual observer. It is but natural to conclude that what seems to be the condition of ore deposition in one district will be true of others, and generalizations have thus been made which further examinations have not always corroborated. No one person can be familiar with all the mineral regions of the globe, and, beyond some broad principles, generalizations based on the study of one or even several individual districts are not to be depended upon as necessarily true of all others. For example, the gold-bearing quartz veins of California, particularly along the Mother Lode, are almost always inclosed between slate and greenstone (diorite or diabase), and a certain writer in the California State Mining Bureau Report for 1888, under the title "Lithology of Wall Rocks," has made the statement for general application, that veins thus characterized are always the richest, and, further, that when such conditions occur gold is almost sure to be found. He advises prospectors to procure a sample specimen of greenstone for comparison with the dikes found associated with any quartz veins which he may discover. This is, perhaps, an extreme case, but it is to show the fallacy of such statements concerning the significance of wall rocks, not only with regard to the idea that a dike of any particular mineral composition is better than another, but also as to the real derivation of the ore, that I wish to describe the conditions obtaining in some of the more important mining districts of California, and to see if we can understand what they really do teach. The point then is: Do certain wall rocks indicate rich mines, and are the metals derived from these wall rocks, or from deep seated regions whose nature we do not know?

The great Mother Lode, stretching along nearly the whole length of the western slope of the Sierra Nevada, is composed of gold-bearing quartz veins. For a distance of 120 miles the lode lies in a stratum of black slate, which has been intruded conformable to strike and dip by many dikes of diorite, diabase and serpentine. The quartz veins occur in fissures, and generally at the contact of the dike rocks with the slate. Nevertheless, wherever the dikes are not continuous, and breaks several miles long sometimes occur, the veins preserve a regular course apparently independent of the presence of the intrusives. The only difference observable is in regard to the regularity of the veins. If the country rock does not cleave well they are more bunchy than when bordered by the smooth regular wall of the dike. When bodies of serpentine lie in the line of the fissure, the greatest irregularity in the quartz bodies is shown.

After a careful study of the whole length of the lode I could come to no other conclusion than that the poverty or richness of the quartz was wholly independent of the character of the wall rock. Both rich veins and poor veins occur with every combination of wall rocks known along the lode. The dikes having been intruded during violent earth movements, their contact with the slates affording lines of weakness, were later utilized for the upward passage of the mineral-bearing solutions. Some of the best mines are located on ledges fully half a mile from any known outcrop of intrusive rock, and have been opened to a depth of 1,200 to 1,800 ft. These show the same character in the deepest workings as near the surface. There is no indication whatever that the minerals have been leached from the adjacent walls. In fact, everything, from both a chemical and physical point of view, indicates that they have not. The chemical action which led to the abstraction of the minerals from their original highly disseminated condition through rock masses must have taken place at far greater depths than it is possible to reach in mining undertakings. It is impossible for us to postulate the composition of those rock masses. Gold is disseminated in exceedingly minute quantities in nearly all substances. It is probable, however, that it is more abundant in the heavier and more basic masses of the deeper portions of the earth's crust.

Sulphur, in combination with iron or copper, is almost always intimately associated with gold. If the gold had been leached from the adjacent walls, how is the presence of the sulphur to be accounted for? I do not know that analysis has revealed it as a primary constituent of intrusives. Its known relation to volcanic phenomena would indicate that it was certainly derived from regions of great chemical activity. Cinnabar, sulphur and gold occur together in some of the mines of the coast range, in the openings of hot springs, which are not yet extinct, and under such conditions as to indicate a deep seated origin, and one which has no relation to the inclosing rocks on the surface or at any depth that can be reached.

Shasta County, in the northern portion of the State, is one of the most interesting regions in which to study the relation of ore deposits to the geological structure and formation. The coast ranges and the Sierras unite in this county, producing a very complicated structure. Intrusive bodies are to be found everywhere, and the minerals are abundant and of great variety. Of the 10 or more districts in the county, scarcely any two have the same character of ore. Gold is found in quartz veins, in schists, near bodies of serpentine and diorite porphyrite, at the contact of schistose or slaty rocks with quartz porphyry, feldspar porphyry, and diorite, and inclosed in quartz porphyry. It occurs with base ores carrying silver in quartz porphyry and at the contact of porphyry with slate. Silver is also found in granite in the South Fork district. On Iron Mountain are immense bodies of copper and iron sulphurets carrying gold and silver and inclosed in quartz porphyry. Almost adjoining is a great body of very pure iron ore with scarcely a trace of sulphur. In the Squaw Creek district, and not more than a mile from the northward continuation of the mineralized zone just described, and in the same body of eruptive rock, are veins of quartz rich in free gold with no trace of base metals. Two more utterly different deposits could hardly be imagined, and yet on the theory that the character of the walls influences the deposit, or that it has been derived from them, we should expect similarity.

East of French Gulch are extensive gold-bearing veins with only one small body of eruptive rock within several miles. This does not appear on the surface, but is met with in the workings of one mine, the Gladstone. Fissure systems of more or less regularity depending on the geological structure are present in every mining district.

That there is an important relation existing between bodies of eruptive rock and ore deposits, I by no means deny; for those portions of the country where no dikes are found are but poorly mineralized; but I believe this relation to be purely one of agent, the strongly marked contact between dike and country rock affording a passage from regions of chemical activity. The character of the mineral deposits depends partly on the nature of the chemical action; the material subject to that action, which may or may not be similar to the intrusives which reach the surface and are exposed to our view; and partly on the complex chemical conditions obtaining in the crushed zone or fissure penetrated by the mineral bearing solutions. That dikes are not necessary to well defined fissures is also apparent when the structure of the country rock is favorable.

The gold deposits of Southern California, from Frazer Mountain through the San Gabriel and Peninsular ranges to the Mexican line, occur very generally in mica schist or gneiss, wholly independent of eruptive masses.

A belt of metamorphic schists inclosed in granite, extends in a direction a little west of north and east of south, through the Peninsula range of San Diego County, from the Mexican line to the northern end of the Santa Ana Mountains. The southern portion of these schists is gold-bearing, and the most prominent district is known as the Julian. The veins occur along this belt of schists for 20 miles. In the Julian district proper the veins are wholly in a slaty mica schist. Dikes of pegmatite appear in places, but bear no relation to the ore deposits. The rocks cleave well, and the veins, though generally rather small, are well defined and rich. The Stonewall, the best known mine in this region, is in gneiss of metamorphic origin.

The northern extension of this belt of schists in the Santa Ana Mountains is silver-bearing, and contains no quartz veins. The rocks are not so highly metamorphosed as farther south; granite appears in places, while there are great bosses and dikes of greenish intrusives, including syenite and diorite, porphyrite and lighter colored felsites. The sedimentary rocks are more crushed than in the Mother Lode region, and the dikes and mineral deposits are correspondingly irregular. The mineral belt has a length of about 15 miles along the western slope of the mountains, following quite closely the direction of strike. The fissure system follows the line of weakness at the contact with the dikes as far as possible, but the deposits occur with or without a dike wall, the dikes apparently having had no other influence than to make them more regular. Considerable variation in the amount and character of the base metals is shown in the different mines, but it bears no known relation to the character of the walls.

Concerning other regions of the West, with which I am not familiar, the statement has been made, and by men of reputation, that the metaliferous deposits are in many cases directly traceable to some intrusive mass adjoining. This I do not dispute, but my observations have led me to the conclusion that this is more rarely the case than has been supposed. I am not aware that the theory of lateral secretion has been proved in any of the mines in California.

A crushed zone or fissure system is one of the essentials to the deposit of ores, but back of this lie the deep seated chemical activities which are going on in many disturbed regions, and while the presence of intrusive masses does not seem to be necessary, yet they are usually found in such regions and offer exceptional advantages for the passage of mineral solutions.

The decomposed condition of the walls of a vein is advanced by the advocates of lateral secretion as one of the proofs that the metals have been derived from them. Crystalline rocks adjacent to veins, whether mineral bearing or not, are always more or less decayed. The pressure and movement of the walls on each other has produced this in part. Liquids forced up from below have penetrated the walls through minute fissures and cracks, hydrating the components, and if carried far enough may remove a part of them and substitute others. The distance to which this alteration extends depends on the nature of the rock. Sometimes it is scarcely a foot. The fact that gold can or cannot be detected in the walls, has no bearing on the question. It is indisputable that extensive deposits of minerals do occur with no known intrusive within miles. As I have said before, we do not know the nature of the rock at great depths, where, in my opinion, the minerals were obtained. It may or may not be like the wall rock on or near the surface. The question as to whether mineral deposits are permanent in depth is one which has no direct bearing on the topic discussed in this paper. No matter where the minerals were obtained their deposit was dependent on certain chemical reactions.

Then in conclusion, mineral deposits are more frequently found in regions of great disturbance and of volcanic activity. This gives rise to chemical action, and access upward toward the surface of mineral bearing solutions is facilitated by the existence of fissure systems, into which dikes may or may not have been intruded.

THE JEFFREY STEEL CABLE CONVEYOR.

The accompanying illustrations represent some of the parts entering into the construction of the Jeffrey steel cable conveyor. It consists chiefly, as will be seen by Figs. 1 and 2, of steel wire rope of the best quality, to which iron projections of several forms are fastened. Fig. 3 is an intermediate or transmission clamp that engages in suitable gaps in the rim of the transmission wheels, which drive the rope.

Figs. 4 and 5 show another form of transmission clamp having a circular disc extension which does the conveying. These clamps are made in halves and secured firmly to the rope by means of two or more strong machine bolts. They are made in various styles and shapes to best suit the purposes for which they are intended. To accommodate the different materials to be handled, the troughs in which the rope and clamps move are also made in various forms. Fig. 6 represents one having a semi-circular bottom of steel or iron which is firmly screwed or bolted to wooden sides. This construction is especially desirable where small and abrasive substances are to be handled, such as coal, ore, stone, gravel, cement, rock, pebble phosphate, etc. Fig. 7 shows another form of trough, V-shaped, which is applied to the handling of various kinds of material.

Chain elevators, conveyors and chain-belt power transmission machinery are now made in an almost endless variety of patterns and sizes, and are too well known to require any detailed description here. Chain, however, owing to its peculiar construction and consequent weight, necessarily limits the height and length of elevators at which such elevators can be safely and economically operated. The growing demand for long distance conveying machinery has brought into prominence steel wire rope as a suitable device. It possesses the essential features of strength and simplicity of construction at a minimum of weight. These make possible the construction of conveyors of great lengths, varying from 300 to 1,500 ft. centers, and it is questionable whether the limit has been reached.

They are especially desirable at coal mines and coal storage plants to distribute the coal into the storage bins and convey the slack to the most convenient place. A great advantage that cable conveyors possess over chain is that they can be readily driven either from the receiving or delivery end, wherever power can be most conveniently attached. Both cables can be run on the same plane, and be made to do duty, one carrying the material out and the other bringing it in, or they can also be made to return one under the other, and describe a number of angles when necessary. There are also a large number of other purposes for which these conveyors could be used to a great advantage.

The conveyor illustrated is made by the Jeffrey Manufacturing Company, of Columbus, O., makers of a great variety of similar appliances. This company is now increasing its already large plant and improving its facilities. It has also established branch offices in Chicago and New York.

FIG. 1.

FIG. 2.

FIG. 3.

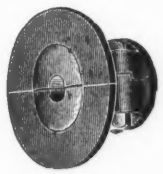


FIG. 4.

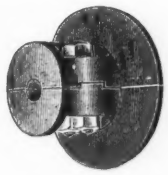


FIG. 5.

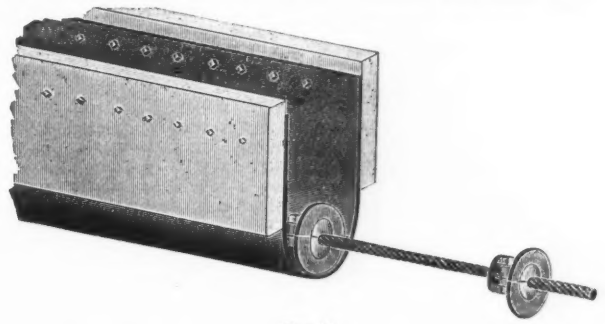


FIG. 6.

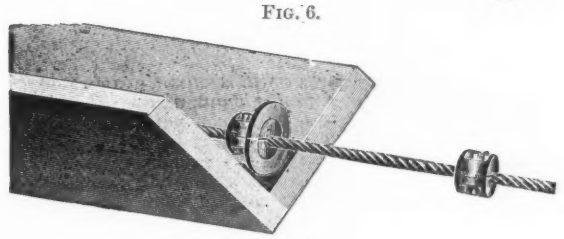


FIG. 7.

THE JEFFREY STEEL CABLE CONVEYOR.

The Production of Metallic Chromium by Electrolysis.—Mr. E. Placet describes, in *Comptes Rendus*, his method of producing pure metallic chromium by electrolysis. Many samples of chromium hitherto prepared contains a great deal of combined carbon, and Mr. Placet considers that the metal produced by his process is absolutely pure. He electrolyses an aqueous solution of chrome alum to which has been added an alkaline sulphate and a little sulphuric acid. A brilliant deposit of chromium is formed on the negative electrode. The metal thus deposited is very hard and has a bluish-white color. It resists the attacks of the atmosphere but is attacked by concentrated sulphuric acid, nitric acid and concentrated solution of potash. This process is not a laboratory experiment but is capable of yielding the metal in quantity on a commercial basis. Mr. Placet is at present using the metal thus prepared in the manufacture of numerous alloys whose characteristics are being duly investigated. He has also applied the process to electroplating and finds that adherent deposits of chromium of any thickness can be produced on brass, bronze, copper and iron. Such deposits resemble oxidized silver in appearance.

THE IRRIGATION QUESTION FROM A BOTANICAL STANDPOINT.

Written for the Engineering and Mining Journal, by Frederick Vernon Coville.

The utility of our arid lands, outside the production, within limited areas, of salt, borax, soda, and a few other minerals, is purely a question of how much vegetation these regions can be made to support. Stock raising, poultry farming, and dairying, although not in themselves industries devoted to the increase of plant products, are nevertheless absolutely dependent upon them. The planning and execution of irrigation systems are problems that belong to geology and engineering, but the utilizing of a water supply thus developed is concerned mainly with the principles of plant growth.

The question is often raised, either purely as a question or by actual experiment, whether our arid lands cannot be made productive without the artificial application of moisture. None, even of our most desert areas, are so arid as to be entirely devoid of vegetation. In many restricted localities the presence of enormous amounts of alkali wholly prevents the growth of plants, but such localities, usually confined to exsiccated lakes in the bottoms of valleys, form a very small percentage of the entire arid area, and could be made arable only by an amount of drainage and soil-leaching, which, outside the cost of irrigation, would entail far greater expense than the result would warrant. But over by far the greater portion of our deserts quite different conditions exist. Notwithstanding the customary descriptions given by those who cross these deserts, that they contain a few scattered bushes of sage-brush, and an occasional tuft of bunch-grass, it is nevertheless true that the vegetation of the desert, although scant, is wonderfully varied and sufficiently productive to support not only wild animals but races of human beings. Two hundred and fifty species of native plants is a moderate estimate of the flora of the Mohave Desert, in southeastern California. In its primitive condition, that is before its occupancy by white men and sheep, it was the home of large numbers of antelope and jack-rabbits, of kangaroo rats, lizards, and other small animals capable of furnishing excellent food. Upon this game and the wild nuts, seeds, fruits, and succulent vegetables of the desert the native tribes of the region actually subsisted. A given area, however, could support only a very small number of Indians, and almost their whole time was spent in collecting food.

The question naturally arises, "If the desert in its natural condition supports as much plant, animal, and human life as this, can it not be made far more productive by cultivation without irrigation?" That this question has often been asked, and that the answer apparently has been in the negative, the many deserted homesteads of Antelope Valley and the southern Tulare plains bear silent but impressive witness. Eighteen lean and hungry jack-rabbits, driven by the summer heat from the dried-up wheat fields, which furnished them neither shade nor food, to the cooler side of an empty ranch-house, form a ridiculous sight, but the picture tells a tale of pitiful human experiences. It may be set down as conclusively demonstrated by repeated unsuccessful trials that the cultivation of the common plant products of the eastern United States, by customary methods, without irrigation, cannot have a continuous reliable result in regions whose yearly rainfall does not exceed twenty inches.

Irrigation aside, we can hope for agricultural progress in the arid lands along only two lines—first, the cultivation and development of the native vegetation of these regions and the introduction of plants already adapted to similar environment in other countries, and, secondly, the introduction of new methods of cultivation applicable to the peculiar conditions existing in arid lands.

In the group of fleshy fruits there is some prospect of additions to those already in cultivation. The buffalo-berry (Shepherdia argentea) of the Great Plains produces an abundance of small, red, acid fruits similar in size, appearance, and taste to those of the cultivated currant, and the plant is already beginning to find its way into the hands of nurserymen. Among farinaceous food-plants a large number used by the native races might be mentioned which would undoubtedly respond

quickly to cultivation. It is doubtful, however, whether any of them, without many years of development and selection, could be produced at a sufficiently small cost to compete with wheat or flour transported from other regions to the same spot. The introduction of plants from the arid lands of other countries has scarcely been attempted yet, except in the direction of forage plants, but in this group of agricultural products several species, both foreign and native, have exhibited, under experimental cultivation, the most marked success. In the year 1888 the United States Department of Agriculture began a series of forage experiments in the arid region of western Kansas. More than one hundred native and foreign plants were grown under various conditions of cultivation, and the results thus far published show, for example, that switch-grass (Panicum virgatum), a native of the United States, produced, per acre, 1½ to 2 tons of hay; Bromus inermis, a grass imported from Hungary, ½ to 3 tons of hay; and the red Kaffir corn, a cultivated variety of Sorghum vulgare, 5 to 7 tons of green fodder. These crops are safe and profitable even in the driest seasons, and in more favorable years luxuriant. The results cited were obtained without irrigation, principally by plowing the soil to the depth of a foot. Compared with the natural product of the region, which is so scant that about fifteen acres are necessary for the support of a single grazing animal, such results give promise of great utility.

The public should, however, be guarded against the impression that the full agricultural usefulness of our arid lands may be brought about by the perfection of mere methods of cultivation. There is excellent prospect that in localities the aridity of which is only a little greater than that of ordinary arable land, great profit will result from a general application of these experiments, but in regions in which the annual rainfall is as low, for example, as five inches, two important and conclusive limitations to success by similar methods exist, the impossibility of the existence of species not specially adapted to desert conditions, and the impossibility of existence of more than a scattered growth of individual plants in so arid a climate.

The natural vegetation of our deserts is made up of plants very different in their characteristics from those with which we are familiar in the eastern United States. The shrubs have small leaves or none at all, a thickened epidermis and cuticle, a coating of resin or of soft felted hairs, and other characteristics which prevent them from drying up before the parching heat of summer. No ordinary plant with its large leaf surface and thin, naked epidermis could withstand the extreme and fatal evaporation to which it must be subjected in the desert, and no cultivated plant has yet, by long propagation and selection, attained a character requisite for maintaining its life under desert conditions. The desert plants which show the least adaptive modification are the annual herbs, the duration of the life of which is but a single season. They are not subjected to the severe drought of late summer and the winter season, and do not require so much protective modification as perennial plants. This is an important hint that nature gives to the agriculturist, to the effect that in very arid lands annual forage plants may be expected to produce much larger returns, without irrigation, than perennials.

That the second limitation is equally important is evident to any one who has considered the scantiness of desert vegetation. The natural plant growth of any piece of arid land takes up all the moisture which does not run off the surface or which is not evaporated from the soil directly into the air. By a proper manipulation of the soil the waste moisture may be reduced to a minimum, yet supposing that the whole rainfall might in this manner be devoted to the use of the vegetation, there would be a definite limit to the amount of forage produced, for only so many plants could grow as could be furnished with sufficient moisture to replace that which they are constantly transpiring from their leaves.

Taking all these principles into consideration, we may expect, in arid regions whose yearly rainfall is in the neighborhood of twenty inches or more, that the selection of new varieties of cultivated plants and the development of improved methods of cultivation will materially enlarge the agricultural product without irrigation, but that in regions of considerably greater aridity these devices, in the absence of irrigation, will prove futile and that an artificial water supply will prove indispensable.

Electricity in Mining Schools.—A decree from the French Ministry of Public Works dated February 2d, last, directs the establishment of a professorship of "industrial electricity" in the National School of Mines.

Launch of the "Indiana."—The "Indiana," the first of the three coast-line battleships, was launched at the Cramp yards in Philadelphia, February 28th. She is a high freeboard ship with water-line armor belt and a heavy protective deck, above which are two armored redoubts carrying turrets. The ship is 348 ft. long on the water line and 69 ft. 3 in. beam. Her displacement is 10,400 tons, but with a full supply of coal and stores on board she will draw 24 ft. and displace 11,600 tons of water. She will be propelled by twin screws and her engines will be three in number, having 10,000 H. P. The engines will be of the triple expansion type, will be built abreast in water-tight compartments and will give a speed of from 15½ to 16 knots, the guaranteed speed being 15 knots. The armor will be as nearly impervious to shot as it can be made. The water-line armor belt will be of 18-in. nickel steel and will extend 196 ft. along each side amidships. At the ends of the armor belt is an armored bulkhead athwartships, which is to be 14 in. thick and above that and the water line is to be a casemate belt 5 in. thick. The armament will be as follows: Four 13-in. guns, mounted in pairs in the two main turrets; eight 8-in. guns, mounted in pairs in the four turrets at the corners of the casemate; four turrets at the corners of the casemate, four 6-in. guns, mounted in broadsides, with splinter bulkheads back of them; twenty 6-pdr., and rapid-firing guns; eight 1-pdr. and Gatling guns and six torpedo tubes. The armament is very heavy for her displacement, and to some extent the ship is an experiment in that direction.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Circuit Court (U. S.), Northern District California.

Lakin v. Dolly and Lakin v. Roberts et al.

Mining Claim, Patent, Validity—Evidence, Payment of Taxes.

1. By the provisions of R. S. (U. S.) Sec. 2320 the General Land Office has no power to issue a patent for a mining claim extending more than 300 ft. in width each side of the middle of the lode. Such patent, if issued, is absolutely void, not merely voidable, as to such excess, and can be collaterally attached in an action of ejectment; but, one patent may embrace two or more claims on the same lode.—(Smelting Co. v. Kemp, 104 U. S., 636, followed.)

2. A mining company paid State and county taxes from 1878 to 1888 on certain of its patent covered lands, but in respect to which the patent was void. After 1883 certain occupying claimants paid taxes on their improvements. Held, in an action of ejectment by the mining company against occupying claimants, that the payment of taxes was irrelevant and immaterial to establish title in either party.—Judgment for defendants in both cases.—(Opinion of Hawley, D. J.)

Circuit Court (U. S.), District of Colorado.

Rico-Aspen Consolidated Mining Co. et al. v. Enterprise Mining Co.—(In Equity.)

Mines and Mining—Tunnel Locations—Local Regulations—Surface Marking—Date of Tunnel Locations.

1. The location of a mining tunnel under Rev. Stat. (U. S.) Sec. 2323 does not entitle the locator to the full length of a surface-location (1,500 ft.) on any vein or lode discovered on the line of the tunnel, but leaves the length of such location to be determined by the local laws or regulations; and in Colorado such length is fixed by Act of Leg., 1861, Sec. 5 (1 Sess. 166) at 250 ft. each way from the tunnel. (Tunnel Company v. Pell, 4 Colo., 507, distinguished.)

2. A miner who discovers a lode or vein, while driving a tunnel, under the provisions of R. S. (U. S.) Sec. 2323, must mark the boundaries of his claim on the surface, and file his certificate of location, but the discovery in the tunnel suffices for the usual work, such as shaft, adit, or other opening, and the date of such location on the surface will be carried back to the date of locating the tunnel, and will thus shut out intermediate surface locations by others.—Opin. of Hallett, D. J. U. S., Dec. 22, 1892.)

Circuit Court of Appeals, Ninth Circuit, District of Montana.

Mining Claims—Dower—Locator's Interest.

Case: At Law, to Recover Dower in a Mining Lode.—Ross, D. J., Opin., Oct. 6, 1892.

1. The mere possessing right given by the Rev. Stat. (U. S.), Sec. 2322 to the location of a mining claim is not such an estate as that dower can be predicated thereon by State legislation as against the United States or its grantee. (49 Fed. Reporter disapproved.)

2. Congress (by stat. as above cited) has conferred with certain limitations on all locators of mining claims, and their legal representatives, so long as they comply with the Federal laws, and with State, territorial and local regulations not in conflict with United States laws, Governing their possessing title, the exclusive right of possession and enjoyment of all the surface included within their lines of location, and of all veins, lodes and ledges throughout their entire depth the apex of which lays inside of surface lines extended downward, vertically, although such veins, lodes or ledges may so far depart from a perpendicular in their downward course as to extend outside of the vertical lines of surface locations.

3. The interest of the locator of a mining claim is in some respects not unlike that of a copyholder at common laws. Both had their origin in local custom, and in each the custom crystallized into law.—Judgment of Dist. Court affirmed: Black v. The Elkhorn Mining Co.

Department of the Interior

Mineral Claim—Agricultural Entry.

The adverse possession and occupancy of a mineral claimant will not defeat an agricultural entry where the land is subsequently shown to be non-mineral in its character.—McIntyre v. Yokum. (Marysville, Cal.—(Secretary, dec. Jan. 19, 1893.)

Mining Claim—Publication Adverse Claim.

The period within which an adverse claim may be filed is limited to the sixty days of publication required by the statute (Sec. 2325, R. S. U. S.). In re Ledger Lode claim (Helena, Mont.)—Sec'y, dec. Feb. 7, 1893.)

Mining Claim—Amended Survey—Deposit.

1. Where an amended survey is required the enterer should be informed thereof, and if he fails to comply with such requirement within a designated period the entry will be canceled.

2. It rests within the discretion of the Surveyor-General to regulate the amount required as a deposit to cover the expenses of office work on a mineral survey, and it will not be assumed in the absence of any showing that the sum required is unreasonable.—In Re Vanderbilt Lode. Nogal. Min. Dist., N. M.—(Sec'y, dec. Feb. 8, 1893.)

Placer Claim—Reservation, Stone Land.

Lands reserved for the benefit of public schools, or where donated to any State, are not subject to placer or stone land entry, under act of August 4th (Sec. 1), 1892.—In re Harper et al. (Helena, Mont.)—(Secretary, dec. February 9th, 1893.)

U. S. Circuit Court of Appeals Eighth Circuit, District of Wyoming.

Master and Servant—Defective Appliances—Mines—Contributing Negligence—Scope of Employment—Miners Rules—Case: Action for Injuries in Mine.

1. When a certain part of the roof of a mine falling injures a laborer, was known to the officers to consist of treacherous rock needing constant watching and liable to be loosened when wet, and when it had not been tested for several weeks; that it had long been wet; that

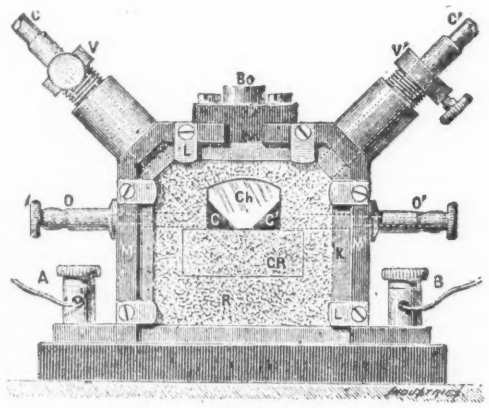
similar rock near by had been supported or removed—it is a question for the jury whether the failure to support, or remove such rock was a lack of ordinary care in providing a safe place for miners to work in.

2. Where a miner injured by rock falling from mine roof has been employed in that dip only two weeks, knows nothing of inspecting roofs, works in darkness except the light in his cap, is unable to reach the roof in that place with his hand (the proper test being sounding with the hand pick or cane), has seen rock fall from that place and other parts of the slope and testifies that he apprehended no greater danger there than elsewhere, and where miners frequently passed under the place without apparently apprehending danger, the question whether he is guilty of contributory negligence is for the jury.

3. A rule adopted by miners, and accepted by their employer required cars to be furnished at the nearest switch for the miners to fill. A miner compelled for two weeks to go beyond the nearest switch for his cars in disregard of the rule, was injured by rock falling from the roof, while so engaged, at a place under which he had to pass to and from his work daily. There being no evidence that he was aware of the rule, held, that he was injured while acting in the line of his employment.—The Union Pacific R. R. Co., plaintiffs in error, v. Jarvi.—(Sanborn, C. J., opin., Oct. 17, 1892.)

AN ELECTRICAL FURNACE FOR THE LABORATORY.

The electrical furnace promises to be not only of enormous commercial importance, but also to be a valuable piece of laboratory apparatus. The accompanying illustration shows a convenient form of laboratory furnace designed and made by Messrs. Ducretet & Lejeune, of Paris. The block of fireclay C R is the crucible, which can be taken out at will. The carbons C C¹ can be moved by the screws V V¹, or, by being pushed out after slackening the set screws. O O¹ are the terminals. The experiments can be watched, as the ends are covered in by mica, held by the clasp L fastened to the metal framework M M¹.



SECTIONAL VIEW OF FURNACE.

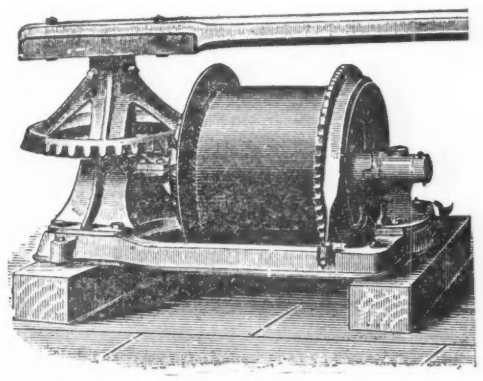
This furnace will work with a current of 12 volts and 12 amperes.

The illustration is from "Le Genie Civil," and that paper states that the furnaces work very well in use.

The Panama Canal.—M. Flory, the Government accountant appointed to examine the acounts of the Panama Canal Company, reports that the total amount received by contractors for real and alleged work on and supplies for the canal was 462,620,064 fracs (about $93,000,000). Of this amount 102,358,444 francs ($20,500,000), represent labor alleged to have been paid for, according to the roll of wages, and sums expended on various undertakings. In the absence of vouchers, it is impossible to ascertain whether the labor and other operations charged for were actually executed. The American Dredging Company's charges for its operations, plant, etc., amount to 69,305,396 francs ($14,000,000). No vouchers or documents are obtainable whereby the profits of the contractors could be estimated. The account of the American Dredging Company included an unexplained indemnity item which nothing appeared to justify, and which amounted to 10,800,000 francs ($2,160,000). Another American firm account for operations and plant amounted to 16,280,684 francs ($3,250,000). The books of this firm, M. Flory says, have been so irregularly kept that the admitted balance of profits, amounting in the total to 7,978,511 francs ($1,600,000) must be accepted with reserve. The company of French engineers declares its expenditures on operations and plant to have been 35,398,810 francs ($7,800,000). This account ostensibly shows a loss of 6,142,955 francs ($1,230,000). M. Flory points out that this includes allotments and commissions to the Societe de Depots et Comptes Courants, of which Charles de Lesseps and Henri Cottu were directors. Another contractor received 76,211,002 francs ($15,300,000), on which the admitted profit was 20,723,285 francs ($4,150,000), Charles de Lesseps and Henri Cottu again sharing in the profits as directors of the Societe de Depots. Another firm obtained 50,858,944 francs ($10,172,000), of which 11,437,381 francs ($2,300,000) was admitted to be purely profit, divided between the firm and the principal financial agent of the Panama Canal Company. Still another contractor received 37,627,836 francs ($7,530,000), the clear profit on which was 12,515,382 francs ($2,510,000). M. Eiffel's charges for operations and plants amounted to 72,653,226 francs ($15,000,000), on which the net profit was 33,073,455 francs ($6,610,000). M. Flory calculates the total traceable profits of the contractors at 77,747,504 francs ($15,550,000).

THE REYNOLDS HORSE WHIM.

The Reynolds whim is simple, compact and light, and has lifting and brake motions, easy in action and insuring perfect safety. The construction allows the horse to travel continuously, all motions being under the control of two hand levers. The lifting lever controls a cam surface which throws the main drum for the cable on and off a friction cone. The second lever controls a powerful band friction brake. Both motions are positive, and require but very little force on the hand levers. The brake has been subjected to severe tests without ever failing; the wearing parts of the driving friction cone and the band brake are of wood and may be easily renewed. The large driving bevel gear has its teeth on the underside, which is an advantage in preventing undue wear of the teeth from falling refuse. A novel and important feature of this whim is the positive safety pawl, which allows the load to be suspended at any point without holding or fastening the levers. This allows one man to operate the whim and the bucket at the top of the shaft. The gallows frame is simple and may be constructed of rough hewn timber.



THE REYNOLDS HORSE WHIM.

French Imports and Exports of Ores.—According to *L'Echo des Mines et de la Metallurgie* the imports and exports of ores into and from France during 1891 were as follows:

	Imports. Tons.	Exports. Tons.		Imports. Tons.	Exports Tons.
Lead ores	3,893	13 280	Tin ores	....	....
Copper ores	10,024	11,802	Pyrites:		
Zinc ores	36,757	31,662	Silver ores	1,245	103
Manganese ores	44,919	1,494	Other ores:	Kilos.	Kilos.
Antimony ores	208	1,153	Antimony and Platinum		
Nickel ores	6,165	26	ores	7,176	....

French Mines.—According to "L'Echo des Mines et de la Metallurgie," there are 131,823 miners employed at the coal mines of France, of which 93,962 work under ground and 37,870 above ground. Of those working under ground 5,331 are children less than 16 years old; of those working above ground, 3,989 are women, and 4,820 children. At the metalliferous mines of France there are employed 13,641 miners, of whom 9,232 work under ground, 77 being children, and 4,409 above ground. Of these latter 578 are women and 276 children.

Comparative Tests of Cut and Wire Nails.—The test of the comparative holding power of cut nails and wire nails recently made at the Watertown Arsenal, showed the cut nail to have considerably greater resistance. The following is the record of some of the tests:

	Comparative holding powers, lbs.				
Wire nail	733	673	675	594	879
Cut nail	836	742	804	964	1,200
Difference	103	69	129	370	321

Canadian Importation of Mining Machinery.—Mining machinery to the value of $61,848 was imported into Canada free of duty during the year ending June 30, 1892, according to the "Canadian Mining Review." Of this, $4,630 came from Great Britain and $57,218 from the United States. Ontario imported the largest amount, $25,824; Nova Scotia coming next with $13,784.

DIVIDENDS PAID BY MINING COMPANIES DURING FEBRUARY, 1893.

NAME OF COMPANY.	Paid in Feb.	Paid since Jan. 1st.	NAME OF COMPANY.	Paid in Feb.	Paid since Jan. 1st.
Alaska, Tr'd'w'll, Alaska	.....	$75,000	Idaho, Cal.	$7,750	$15,500
American Turquoise	.....	60,000	Kennedy, Cal.	.....	50,000
Belden Mica, N. H.	$5,000	10,000	Lexington, Colo.	3,000	6,000
Bimetallic, Mont	40,000	80,000	Mayflower Gravel, Cal.	10,000	10,000
Centennial-Eureka, Utah	15,000	30,000	Minnesota Iron, Minn	.....	210,000
Champion, Cal.	3,400	6,800	Mollie Gibson, Colo.	150,000	300,000
Colorado Central, Colo.	....	13,750	Morning Star D., Cal.	.....	7,200
Colorado Fuel Co., Colo.	67,120	67 120	Napa Cons., Cal.	.....	20,000
Cons. New York, Nev.	10,000	10,000	Pacific Coast Borax	.....	15,000
Copper Queen, Ariz.	100,000	100,000	Parrott, Mont.	18,000	36,000
Daly, Utah.	37,500	75,000	Quincy, Mich.	150,000	150,000
De Lamar, Idaho.	.....	100,000	Red Cloud, Idaho	.....	10,000
Enterprise, Colo.	25,000	50,000	Seven Stars, Ariz.	.....	97,500
Golden Reward, S. Dak.	5,000	10,000	Standard, Cal.	.....	10,000
Great Western Quicksilver, Cal.	12,500	25,000	Trinity River Hydraulic, Colo.	2,500	2,500
Hecla Con., Mont	15,000	30,000	Utah, Utah	.....	5,000
Homestake, S. Dak.	12,500	25,000	W. Y. O. D., Cal.	3,000	6,000
Hope, Mont.	50,000	75,000	Total	$742,270	$1,792,370

PERSONALS.

Mr. R. C. Berkeley, Jr., lately connected with the West Virginia Central & Pittsburg Railroad, has opened an office as consulting engineer in Chicago.

Mr. F. D. Broughton, until recently with the Deadwood & Delaware Smelting Company, has accepted the position of superintendent of the Oro Fino mine.

Mr. F. C. Fricke, recently chemist at the Lucy Furnace, Pittsburg, has opened an office as consulting and analytical chemist in the Ferguson Building in Pittsburg.

Mr. Rudolph Hering has been engaged to make a thorough sanitary survey of the city of Louisville, Ky., with the view to the planning of a new sewerage system.

Mr. W. D. Rees, recently with the Republic Iron Company, has been appointed treasurer and managing director of the Lake Erie Iron Company, succeeding Mr. J. S. Fray, Jr., of Boston.

The address of Mr. Paul Brosig, mining engineer, who left Germany for America about 14 years ago, is wanted by an old friend now in South Africa. Any communication will be forwarded by the Engineering and Mining Journal.

Mr. John W. Mackay, the well known mining operator of the Comstock Lode, was shot on the 24th inst. by a semi-demented victim of unsuccessful stock speculation. The latest advices from San Francisco, Cal., report Mr. Mackay out of danger and improving rapidly.

OBITUARY.

Col. Richard Vose, who died in Nyack, N. Y., February 25th, was the inventor of the spiral spring so generally used on cars, and was for many years the head of the largest car spring company in the country. He was 63 years old, and was widely known among railroad men and manufacturers.

Privy Councilor N. J. v. Kokscharow, the leading Russian mineralogist, author of 11 volumes of the "Mineralogy of Russia," president of the Mineralogical Society of St. Petersburg, and a member of the Academy of Sciences of St. Petersburg, died on January 2d, 1863, at the age of over 80 years.

J. E. Ward, a prominent mining and business man of the San Juan region of Colorado, died at his home in Durango, Colo., on the 22d ult., aged 46 years. He went from Bristol, Conn., eight years ago as manager of a silver mine at Silverton. He organized the San Juan Coal Company, and was the principal owner of it at the time of his death. He owned property at Oro Fino and La Plata, Colo.

The recent death of Mr. Isaac Collins Chesbrough, at Copake, N. Y., removed one of the last of the engineers employed in the original construction of the Baltimore & Ohio. Mr.. Chesbrough was 79 years old, and served as assistant under Mr. Latrobe and Major Whistler from 1830 to 1835. He was employed on the Boston & Providence, the Western and the Vermont Central roads; in later years he located the Northern Pacific over the Rocky Mountains. For many years he was in charge of the Copake Iron Works, in Columbia County, N. Y., and also had the supervision of some large land interests in Michigan.

SOCIETIES.

At the regular meeting of the Northwest Railroad Club, in St. Paul, Minn., February 14th, Mr. John Hickey read a paper on "Boiler Inspection." He advised more careful testing, and the use of both hydraulic and steam tests in inspection.

At the regular meeting of the Western Society of Engineers in Chicago, March 1st, the following papers were read: "A Reduction Formula for Stadia Leveling," by Mr. J. L. Van Ornum, and "The Relation of Railway Signaling to Train Accidents," by Mr. W. W. Salmon.

At the meeting of the New England Railroad Club in Boston, March 8th, the subject for discussion will be "Air Brakes, with Special Reference to Their Application to the Front Wheels of a Locomotive." This meeting will also be the annual meeting of the Club; officers will be elected and other business transacted.

At the adjourned annual meeting of the Wisconsin Polytechnic Society February 13th, the following were elected officers for the year 1893: President J. N. Barr; first vice-president, W. F. Goodhue; second vice-president, Chas. W. Boley; secretary, W. S. Mason; treasurer, M. A. Beck; trustee 1893, H. C. Koch; 1893-4, E. G. Cowdery; 1893-5, Richard Birkholz.

The officers chosen by the American Institute of Mining Engineers, as announced at the Montreal meeting last week are: President, Henry M. Howe, Boston; vice-presidents, A. J. Bowie, San Francisco; Robert G. Leckie, Londonderry, N. S.; E. G. Spilsbury, Trenton, N. J.; managers, H. H. Campbell, Steelton, Pa.; W. L. Sheafer, Pottsville, Pa.: A. M. Shook, Tracey City, Tenn.; treasurer, Theodore D. Rand, Philadelphia; secretary, Rossiter W. Raymond, New York.

At the regular meeting of the Engineers' Club of Philadelphia, February 18th, Mr. S. M. Vauclain read a paper on "The Baldwin Four-Cylinder Compound Locomotive," illustrated by lantern slides and a model working under steam. Descriptions were given of the various types of two, three and four-cylinder compound locomotive engines; also statistics of the performance and rates of economy of the Baldwin engine. The paper was discussed by Messrs. Wilfred Lewis, Loss and Christie.

The new physics building of McGill University, Toronto, which was presented to the University by Mr. W. C. McDonald, has been formally opened. It is a plain building externally, but admirably adapted for its purpose. It contains machine shops, carpenters' and pattern shops, hydraulic testing room, electrical rooms, class rooms, laboratories and professors' rooms. The boiler room has five Babcock & Wilcox boilers, and in the engine room are a stationary engine, pumps and a triple-expansion marine engine of the latest pattern.

At the annual meeting of the Canadian Society of Civil Engineers in Montreal, February 23d, the election of officers resulted as follows: President, E. P. Mumford, Montreal; vice-presidents, Thomas Monroe, Couteau Landing; P. A. Peterson, Montreal; W. J. Jennings, Toronto; treasurer, Herbert Wallace, Montreal; secretary, C. H. McLeod, Montreal; librarian, Wm. McNab, Montreal; members of council, H. T. Bovey, Montreal; St. George Bowell, Quebec; H. B. Lumsden, Toronto; P. W. St. George, Montreal; J. D. Barnett, Stratford; Allan McDougall, Toronto; G. C. Cunningham, Montreal; G. A. Mountain, Ottawa; C. K. Domville, Hamilton; C. H. Keeper, Toronto; H. S. Poole, Stellarton; Thomas Rideout, Ottawa; F. R. F. Brown, Moncton; E. Mohun, Victoria, B. C.; F. R. Redpath, Montreal.

At a regular meeting of the Engineers' Club of Cincinnati, held in January, there were 22 members present. Mr. M. D. Burke read a paper on "Country Roads—the Position Which Their Improvement Should Occupy in the Internal Development of the United States." After briefly referring to the growing interest being taken in the subject of the improvement of the roads of the country within the last few years and the benefits to be derived therefrom, Mr. Burke outlined a plan of organization and the ways and means for carrying it out, for a Department of Public Works which should have charge of certain of the works now carried on by the Government through its various departments, and that one of the divisions would be that of public roads. It would also have direction of the improvement of inland waterways and drainage and irrigation streams. He would incorporate the Coast and Geodetic Survey in this department on Public Works, and have a system of triangulation extended over the entire United States. The scheme to embrace the planning and execution of all public works in the land, the organization of a corps of United States engineers which shall establish lines for the basis of all official surveys and maps, and design and direct the execution of all works properly belonging to the general government, with the exception of those of a military nature or for coast and harbor defense and fortification. The part of the organization applying to the location, construction and betterment of the roads of the country was kept well in view throughout the paper and its details clearly set forth the local work to be under the direction of a corps of engineers that might be organized in each of the several States.

EXPORT NOTES.

M. Siegfried, minister of commerce, has submitted to the customs committee of the Chamber of Deputies of France a proposal for recasting the petroleum duties, according to which the duty on refined petroleum would be 16 francs, to be collected on its leaving the factory, and levied on 90% of the production. The duty on raw petroleum would be 13 francs.

In Peru the best illuminating oils come from the United States. The best quality of American kerosene is now selling in Peru at 6 soles per case of two 5-gallon cans each. An English company began the refining some time ago of Peruvian petroleum at Talara, and it was thought that the product would supplant the American oil all along the Western coast. The Talara oil sells at 2·50 to 2·80 soles, while the American oil sells at 6 soles per case. The Talara oil, however, is ill refined, and emits an almost insufferable odor. The entire shipment of illuminating oil by this company last year amounted to 67,000 cases. Their product is lacking in paraffine, and, being uncongealable at low temperature, is better adapted to lubricating than to illuminating uses. An effort will be made to have still higher duties placed on the American product, while the company proposes to put their oil on the market at Callao soon at 1·80 soles per case. The American product pays a duty of 2·73 soles per case, or 6 cents in silver per liter. Add to this duty the freight from New York, which is usually about 20 cts. per case and 10 cents landing charges, and the total expenses on American oil laid down in Callao is about 3 soles per case of 10 gallons, making the full cost of American oil at Callao about 4·70 soles per case.

INDUSTRIAL NOTES.

The Boiling Spring, Pa., furnace has gone into blast. The furnace will use Cuban ore.

The Kittaning, Pa., Iron Company, has started up its mill, which has been idle for several months.

The old Van Amringe pumice stone mills, near Mamaroneck, N. Y., were burned on the 25th ult. Loss, $50,000.

Application has been made for the appointment of a receiver for the Woodstock Iron Company, of Anniston, Ala.

A reduction of 10% on all wages was made on the 1st inst at the Macungie, Pa., furnace of the Crane Iron Company.

The works of the South Tredegar Iron Company, at Chattanooga, Tenn., which have been idle since November, 1890, have been dismantled.

The stockholders of the Catasauqua, Pa., Manufacturing Company have elected J. W. Fuller president, in place of Oliver Williams, who has resigned.

The Barr Pumping Engine Company, Philadelphia, has completed compound condensers for the water-works at Frankfort, Ky., and Bridgeton, N. J.

The Kenwood Manufacturing Company, of Chicago, has sold out its entire business in hangers, etc., for shafting to the Waukegan Iron and Steel Company.

The Youngstown (O.) Bridge Company has the contract for the erection of a steel bridge, which is to span the Potomac River at Brunswick, Md. It will cost $62,000.

Fifty machinists in the Carnegie Steel Company's Twenty-ninth street mills, Pittsburg, Pa., struck on the 27th ult, refusing "to work ten hours a day for nine hours' pay."

On Tuesday the House of Representatives voted almost unanimously to continue pig tin and ore on the free list. The bill, however, was not reported by the Senate Committee, and so fails for this session.

At a meeting held in Frostburg, Md., recently, a company was organized to build a tin-plate mill in that place. The names of the incorporators are W. R. Percy, Dr. J. J. Jones, Owen Hitchins, Henry Williams and Jenkins Jones.

The Dodge Manufacturing Company, Mishawaka, Ind., has the contract for a large part of the steel shafting, pulleys and hangers for the Chicago Exposition. The Dodge system of rope transmission will be largely used in Machinery Hall.

The South Chicago Street Railroad Company is now preparing to do all the repairing on the rolling stock of their system of roads, and has purchased an entire equipment of machine tools for said work from the Lodge & Davis Machine Tool Company.

The Pittsburg Reduction Company will shortly commence to make extensive improvements and additions to its plant, which will very largely increase its capacity for the manufacture of aluminum. It is said that upward of $150,000 will be expended for this purpose.

The Catasauqua Manufacturing Company, on the 27th ult., ordered the following reduction of wages at its rolling mills at Catasauqua and Fullerton, Pa., to take effect March 4: Puddlers, from $3.65 to $2.25 per ton; skilled laborers, 10%; laborers, from $1.15 to $1.10 per day.

The Otis Steel Company, Youngstown, O., is about to increase its capital from $750,000 to $1,000,000. Contracts are now let for all the work on the company's new steel plant. The boilers will be furnished by the National Water-Tube Boiler Company, of New Brunswick, N. J.

The Joseph Dixon Crucible Company, of Jersey City, N. J., has issued a new and handsomely bound catalogue of its pencils, giving prices, etc., of their extensive line of high-grade products. It is not intended for general ditribution, but will be sent to stationers on application.

A large shaft will be forged at the works of the Duquesne Forge Company, Pittsburg, to be used at the Homestead Steel Works. The ingot will be 27 × 57 in. and 9 ft. long. It will be drawn out 16 ft. and 22 in. in diameter, will weigh 20 tons, and will be one of the largest pieces of steel ever worked at that plant.

Baker & Company, of Newark, N. J., gold, silver and platinum refiners, have issued "Data Concerning Platinum, Etc." a convenient manual for those who have occasion to use that metal. It has tables of weights of platinum crucibles and dishes, of platinum wire, sheet and foil, and also some handy tables comparing weights and measures.

The Mica Insulator Company has been organized at Elizabeth, N. J., with $100,000 capital, and will do business in that place and Schenectady, N. Y. The incorporators and stockholders are Lewis C. Kingsley, Eugene Munsch, Franklin Brooks, Charles W. Jefferson and Arthur H. Saulsbury Dyer. The company will buy, sell and treat mica for electrical insulators.

The American Engine Company's works, of Plainfield, N. J., have shut down, throwing 200 men out of employment. The company's officers say that the high-speed engines have not worked successfully, and that this is the cause of the closing of the factory. The company may resume operations in the fall with another style of engine.

The Fulton Engineering and Shipbuilding Works of San Francisco, successors to the Fulton Iron Works, has issued a new illustrated descriptive circular of mining machinery in the Spanish language. It is a handsomely illustrated and bound volume of 164 pages, which cannot fail to interest Spanish American mining men in American machinery.

The bondholders of the Fort Payne Coal and Iron Company met in Boston February 24th and requested the trustees to foreclose the mortgage, and appointed a committee of three to take such steps as they deemed proper for bondholders' protection. The committee is H. A. Yeaton, of Portsmouth, and A. H. Sayles, of Plaistow. These gentlemen will appoint a third member.

The viewers in the case of the Ahl estate, owners of the Carlisle Iron Works, against the Crescent Pipe Line Company, filed their award on the 25th ult. The case involved damages for right of way and construction of an oil pipe line and telegraph line, 5½ miles long, through mineral and timber lands in Cumberland County, Pa. The estate claimed and insisted on bond being filed for $7,000 before entry by the company. The jury of view awarded $541.80.

On February 25th receivers were appointed for Cofrode & Saylor, incorporated, owning and operating the Philadelphia Bridge Works, at Pottstown, Pa. The firm has done a large business in bridge and structural work, and has some large contracts on hand. The liabilities, it is said, can be met if time is given to carry out these contracts. The firm controls the Reading Rolling Mills, which are involvel in the failure, as is also the allied iron firm of J. F. Bailey & Sons, of Philadelphia.

On the evening of February 28th an explosion of natural gas occurred in the large manufactory of the Ontario Silver Company, of Humberstone, Ont., wrecking the building and seriously injuring three men and a boy. The men were engaged in flushing out the regulator, which had become filled with water, when a quantity of gas escaped into the building. A burning jet caused the explosion. All four were terribly burned. The building was completely wrecked. The plant is valued at $75,000.

At the annual meeting of the Canadian Bell Telephone Company in Montreal, February 24th, the report showed an expenditure of $368,123 for new construction in 1892. The earnings for the year were $875,526; expenses, $655,139; net revenue, $220,386. The capital stock is $2,200,000, and $200,000 new stock for extensions will be issued this year. The old board was re-elected, as follows: C. F. Sise, George W. Moss, W. H. Forbes, Hon. J. R. Thibaudeau, John E. Hudson, Robert Archer, Robert MacKay, Wm. R. Driver and Hugh Paton.

The new works of the Bucyrus Steam Shovel and Dredge Company, at South Milwaukee, Wis., it is expected will start up in about a week. Regarding business the past year the company writes: A number of the improved placer mining outfits, which the Bucyrus Steam Shovel and Dredge Company have been introducing during the past three years, are in successful operation, it is stated. The Fortunas Mining and Milling Company, of Albany, have just ordered a second plant, after testing to their satisfaction the one which they bought last year.

The Midvale Steel Company reports an extraordinary mileage for a set of tires on a Cumberland Valley railroad locomotive as follows: On April 20, 1882, Engine 35, tired with Midvale tires, went into service on the road and has made the following mleage record: 1882, 33,954 miles; 1883, 57,594 miles; 1884, 57,058 miles; 1885, 57,980 miles; 1886, 54,789 miles; 1887, 55,654 miles; 1888, 11,990 miles to April; to first turning, 328,969 miles; from April, 1888, to December 31st, 1892, 173,591 miles; total, 502,560 miles. The tires on this engine have been turned but once, and are still in use.

In the suits of the Aerated Fuel Company, of Springfield, Mass., against the Cox & Sons Company, the Woodbury Glass Company and the Cohansey Glass Manufacturing Company, the Circuit Court of the United States, through Mr. Justice Acheson, has supported the company's contention and rendered decrees in its favor. The suits were brought under the Bullard patent of February 5th, 1889, which covers all apparatus for burning liquid hydrocarbon in the presence of compressed air when the liquid and the compressed air are supplied to the burner through separate conduits and the degree of compression of the air is automatically regulated.

The Bethlehem Iron Company has been awarded the contract for over $2,000,000 worth of heavy armor plate. The Bethlehem Iron Company and the Carnegies were the only bidders. This assures nearly seven years' more work in the ordnance department. The double 6-in. gun tube, 62 ft. long, finished on the 25th ult. at the Bethlehem ordnance works is regarded as a most skillful piece of forging work. The tube was made of a 400-ton ingot. The work was done on hydraulic presses. The tube will be sent to the Chicago Fair as part of the Bethlehem Iron Company's exhibit. After the Fair it will be brought back and cut in two, forming two 6-in. gun tubes, each 31 ft. long.

The Webster, Camp & Lane Machine Company, Akron, O., has recently furnished to the Minnesota Iron Company, for the Tower mines at Soudan, Minn., a large and complete plant of hoisting machinery, consisting of two 22×48-in. Akron Corliss engines, driving four 10-ft. band friction hoisting drums, having capacity each for hoisting a load of 12,000 lbs. from a maximum depth of 1,700 ft. The drums operate independent cages, working in the inclined shafts, which follow the trend of the ore body, the cages being hoisted at a speed of 800 ft. per minute. Steam at 125 lbs. pressure will be furnished by a battery of three horizontal tubular boilers, 72 in. diameter by 16 ft. long, with 44 5-in. tubes in each. In addition to the above mentioned plant, the Webster, Camp & Lane Company have under way a complete modern hoisting plant for the Mansfield Iron Mining Company, of Crystal Falls, Mich., consisting of one 24×48-in. Akron Corliss engine, and two 10-ft. band friction hoisting drums of similar capacity to those mentioned above.

The new Buffalo, N. Y., furnace was lighted for the first time February 25th. The plant of the old Union Iron Company was bought about two years ago by the present company. All of the old structures were torn down, and the present plant, consisting of a cast house, an engine house, boiler house and furnace, was built. The plate mill of the old works was remodeled into a stock house for ore, which is carried from the boats by a McMyler hoist and a Trenton conveyor, an inclined railway carrying the ore buckets from the stock house to the top of the cupola. The furnace is 18 ft. in diameter and 80 ft. high, and has a capacity of between 250 and 300 tons a day of foundry iron. Three Cowper-Kennedy, hot-blast stoves, 18 ft. in diameter and 70 ft. high, adjoin the furnace, and the boiler room contains 14 boilers 54 in. in diameter and 30 ft. long. The three blowing engines which were used in the old works have been set up again. They have steam cylinders 42 in. in diameter, and air cylinders 84 in. in diameter with a stroke of 7 ft. The pumping plant consists of three large duplex pumps with 14-in. plungers, and two duplex boiler feed-pumps with 8-in. plungers.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting machinery or supplies of any kind will notify the Engineering and Mining Journal of what he needs, his "Want" will be published in this column and his address will be furnished to any one desiring to supply him.

Any one wishing to communicate with the parties whose wants are given in this column can obtain their address at this office.

No charge will be made for these services.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

All these services are rendered gratuitously in the interest of our subscribers and advertisers; the proprietors of the Engineering and Mining Journal are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

Goods Wanted at Home.

2,955. A second-hand, light mountain transit, with level to telescope, vertical arc, etc.; also a leveling rod. South Dakota.

2,956. Prices on a lumber dry-kiln, with a daily capacity of 5,000 ft. Virginia.

2,957. An emery grinding machine for grinding and gumming circular saws. Virginia.

2,958. Prices on spool and bobbin machinery. North Carolina.

2,959. An 18-ft. ventilating fan and engine. West Virginia.

2,960. Machinery for the manufacture of horse shoes. Georgia.

2,961. 3,000 ft. 3-in. wrought iron pipe. West Virginia.

2,962. Seasoned white oak spokes. Virginia.

2,963. 10 tons second-hand 20-lb. and 10 tons 12-lb. iron or steel T-rails. West Virginia.

2,964. Outfits for circular saw mills; one mill to have a capacity of 50,000 to 60,000 per day, and the others to cut 20,000 each; all with modern appliances, such as gang edgers, trimmers, cut-off saws, etc. West Virginia.

2,965. An outfit for an electric light station, including a 150-HP. return tubular boiler, a 100-HP., high-speed engine, a 75-kilowatt alternating current dynamo, an arc dynamo for 25 lamps of 2,000 c. p. each, and 200 30-ft. poles 6 in. at tops, chestnut or cedar. Virginia.

2,966. A set of tools for making and repairing boilers, such as punches, plate splitting shears, boiler tools, riveting machines and other tools and fixtures necessary for a boiler shop. North Carolina.

2,967. A complete outfit of machinery for manufacturing fish barrels. North Carolina.

2,968. A double surfacer with broken roll. Georgia.

2,969. A stave saw. North Carolina.

2,970. An engine. South Carolina.

2,971. A planer. North Carolina.

2,972. A header. North Carolina.

2,973. A saw mill. South Carolina.

2,974. Whisk broom and brush supplies, such as fancy metal and perfume handles, India fiber and Mexican fiber. Georgia.

2,975. Drill presses. Texas.

2,976. A grist mill. South Carolina.

2,977. Engine lathes. Texas.

2,978. Prices, etc., on a complete outfit for a yarn mill of 1,000 spindles' capacity, to make knitting yarn. North Carolina.

2,979. A gin press. South Carolina.

2,980. Emery wheels. Texas.

2,981. A thresher. South Carolina.

2,982. Grindstones. Texas.

2,983. A 6 or 8-stamp prospecting mill. Virginia.

2,984. Coffin hardware and hard wood—oak, ash, hickory, poplar, etc. Texas.

2,985. Catalogues, price lists, etc., of manufacturers of barrel hoop machinery. Alabama.

2,986. A stone crusher, capacity about 7 cubic yards per hour, to rent for about six months. New York.

GENERAL MINING NEWS.

ALABAMA.

The Tecumseh Iron Company, operating the Reynolds mines, near Talladega, has a contract to deliver 8,000 tons of brown ore monthly. The company has lately leased the Cochrane mine, at Hamlet, Ga.

Waldo.—This gold mine, near Talladega, has been leased to W. G. Newbury and J. J. Daniels, of Birmingham, who will begin devlopment work at once.

ARIZONA.

Maricopa County.

(From our Special Correspondent.)

Cave Creek District.—A big ledge of ore has been struck in the Philies & Boyd mine, the ore mining from $12.60 to $18 per ton in gold by assay. A small mill is being put up to be run by water power. The Phoenix mine continues turning out rich ore, thousands of tons being in sight. The pneumatic mill is giving trouble. It has been closed down for the purpose of having alterations made.

Yavapai County.

United Verde Copper Company.—This company's tunnel, now running to tap the mine, is in about 1,800 ft., with 40 ft. of sulphate ore in the end of the tunnel. There is one body of ore cut through which is reported to be over 400 ft. wide and 500 ft. long, averaging from 20 to 35% copper, carrying from 1 to 9 oz. of silver, while further south there are several bodies of sulphate ores ranging from 10 to 60 ft. wide, averaging from 15 to 30% copper, with rich iron carbonate carrying gold.

(From our Special Correspondent.)

The New Issue Mine, Cherry.—A run of seven tons of ore realized over $44 per ton, and this has been accepted as so satisfactory that the property is to be developed on an extensive scale. A test run of three tons of ore from the J. H. B. Smith mine yielded an average of $100 per ton, and considerable ore is in sight.

CALIFORNIA.

Napa County.

(From our Special Correspondent.)

During the month of January there was shipped from the county 1,257 flasks of quicksilver, as follows: Great Western, 383; Sulphur Bank, 110; Mirabel, 760; Baker, 4.

Nevada County.

Green Mountain.—This mine, on Osborn Hill, has been bonded for a company of Sacramento and San Francisco people, who will begin operations as soon as the weather will permit. The Green Mountain claim is consolidated with the Sanders claim, and the two claims, it is stated, have produced bullion valued at about $167,000.

Plumas County.

(From our Special Correspondent.)

The Shenandoah Mines, Rich Bar.—This property bids fair to have a new lease of prosperity. Although work has been done only at intervals up to 1888, the syndicate that was then formed appears to have great faith in the property, albeit even then, work was carried on in a desultory way. In 1891 a 10-stamp mill was put up, and a test of the ore made which resulted only in partial success. Recent prospecting on the foot wall has revealed a rich ore body within view 4 ft. in width. Already about 200 tons of rich ore is on the dump, and there is every evidence of a permanent ledge.

San Bernardino County.

Vanderbilt Mining District.—Press dispatches from San Francisco give news of the Vanderbilt mining district in San Bernardino County, near the Nevada line. On the 24th inst. the Vanderbilt

group of mines was sold by W. S. Lyle in behalf of the locator, R. C. Hall, to McKay, Flood & Wells, Lyle retaining a fourth interest. Mr. Lyle recently bonded 3,000 ft. of ledge and sunk eight shafts in all, ranging in depth from 40 to 100 ft. The main ledge was found to be from 15 to 30 ft. in width, the pay streak from 4 to 8 ft. Below the decomposed croppings were found sulphurets that milled over $40 per ton. The new Vanderbilt District is about six miles from what is known as the New York Silver Mining District. About 150 men are working in the New York mines and upward of 100 prospectors are now hunting locations in the Vanderbilt District. The Nevada Southern Railroad, which will connect the Atlantic & Pacific with the Rio Grande Western system, has been built 12 miles out from Goff's toward the Vanderbilt District, and will be extended to the Keystone District, and on through Southern Nevada and Utah to join the Utah Central. The road is intended to develop the mineral belt of Southern Nevada and Utah.

Tuolumne County.

(From our Special Correspondent.)

The Martha Washington Gravel Mine.—Six gravel machines are to be put in within the next month. The pipe is all in and the ground sluice completed, and each machine will be capable of working from 1,500 to 2,000 yards of gravel each 24 hours, cutting down from surface to bedrock in benches. The track on which the machines run is railroad iron, 6 ft. gauge. Water will be utilized to run the 300-HP. dynamo, which will furnish speed for all the machinery and illumination for all operation day and night.

COLORADO.

Clear Creek County.

American Sisters and Two Sisters Mining Companies.—Two suits, involving $100,000 each, were filed in the District Court, at Denver, on the 23d ult., by Mrs. Mary E. Reynolds and Johanna Daily against the American Sisters and the Two Sisters mining companies in the Montana mining district. Mary E. Reynolds is the widow of Joseph Reynolds, of Cook County, Illinois, who died February 21st, 1891. He was the owner of seven-eighths of the Joe Reynolds No. 4 mining lode in the district named, which adjoins the defendant companies' properties, from January 4th, 1882, until his death, and Johanna Daily owns the remaining eighth. Mrs. Reynolds sues as his heir, and charges that the American Sisters and Two Sisters companies at various times between June 12, 1890, and the present, by means of a certain working called the "Old Trapper" tunnel and the Two Sisters' tunnel, have systematically entered upon Joe Reynolds No. 4 lode and extracted, transported and converted to their own use, each company, 10,000 tons of ore valued at $100,000 in each case. Suit is brought against each company for that amount.

San Miguel County.

Tom Boy Mining Company.—This company will hereafter operate the properties formerly owned by the Belmont Consolidated Mining Company, which were recently sold at trustee's sale. Articles of incorporation were filed with the county clerk last week. The capital stock is $150,000. The following are the directors for the first year: T. Waters, Roy F. Wrigley, John G. Taylor, William Brown and William Weston. Mr. Waters will be general manager, and will shortly arrive in Telluride to prepare the properties for active operation.

GEORGIA.

Lumpkin County.

The Preacher mine, near Dahlonega, is being placed in readiness for operation.

It is proposed to build chlorination works in Dahlonega to treat the sulphuret ores of the vicinity.

Chestatee.—On February 21st, as the workmen were excavating the new supply canal at this mine, a bed of gravel was struck that gave good prospects, and the superintendent decided on sluicing the canal to the bedrock in order to save the gold.

IDAHO.

Kootenai County.

More than ordinary interest attaches to the recent reports from reliable sources of the results of operations in the Pend d'Oreille district, says the Spokane "Review." The owners of the properties on Blacktail Mountain are doing a great deal of successful development work. The Blacktail mine, owned by Forbes & Co., has about 20 in. of high-grade that will average, for shipping, over 300 oz. in silver and several dollars in gold. The owners are down on this mine with a shaft 100 ft. in ore and are sacking for shipment The Crown Point is the most notable discovery yet made on Blacktail Mountain. It has about 15 in. of high-grade ore. Besides this there is 27 in. of ore of a lower grade. The owners of the Silver Wave group are working steadily and sacking ore for shipment.

ILLINOIS.

The coal miners of Centralia have returned to work after staying out over two months.

MARYLAND.

The stockholders of the Consolidation Coal Company held their annual election February 23d, with this result: President, Charles F. Mayer; directors, William F. Burns, William F. Frick, James Gregg, William Whiteright, Edward de Rose, Robert Garrett, James Sloan, Jr., George A. von Lingen, William P. Harvey and George de B. Keim.

The change of gauge of the Baltimore & Lehigh Railroad will benefit largely some important industries on the line, including the Peach Bottom slate quarries and the quarries of the Maryland Granite Company, at Deer Creek. These have been unable to secure proper shipping facilities from the narrow-gauge management of the road.

MICHIGAN.

Gold.

Ropes Gold Mining Company.—This company is earning about $500 or $600 per month above expenses. Still it is using up the rock in sight and doing nothing in the way of developing new ground. The rock that is coming from the lowest producing level is of fine grade, but the shutting down of one shift and stoppage of new work is not healthful with reference to the future product of the mine, says "Iron Ore." The good ore met with in certain levels has not been found in the bottom level.

Iron.

(From our Special Correspondent.)

The Humboldt, which has been closed down for a year, is to be reopened.

Large bodies of magnetite have been cut in the Teasdale mine at Humboldt, which is owned in Ishpeming.

The Cleveland-Cliffs new furnace will be built at Presque Isle. It is said that large iron works are to be erected there by Pittsburg parties.

All the mines producing Bessemer ore are increasing their output, for which there is a steady demand. The ore market is firm, as navigation will not open for two months and stocks in Lake Erie ports are low.

Preparations are being made for cutting stations in the two shafts on Section 21, which have reached the depth of 500 ft. Drifting to the ore will then be commenced. In one of them a pump will have to be placed to handle the flow of water. In the other a drift will be started shortly toward the Winthrop.

The organization of the Lake Superior & Ishpeming Railroad has been made public through the filing of papers at Lansing, and Grand Rapids and New York capitalists are interested. A survey is already made. Side tracks will run into the various mines of Ishpeming and Negaunee. A new ore dock is to be built on the lake, and the road is primarily built for the ore trade.

The eight-hour shift plan is being gradually extended; this month the Cleveland Lake shaft, Saulsbury and the Schlesinger mines, at Negaunee, are working upon it. Before long it will be extended to all the mines. It is found that nearly 25% more ore is raised under this method, and that it is actually cheaper to the mine owners. Surface employees, as well as those underground, are included. This means one-third added to our laboring population.

Iron—Menominee Range.

Hamilton-Ludington Iron Companies.—The bailers are now at work, and the Hamilton will be unwatered. "Iron Ore" says it will take many months before the mine becomes a large producer.

Shafer.—Negotiations are under way for the releasing of this mine. At present it is under lease to Messrs. Lindsay & Ross, and the lease will not expire until after 1900. Messrs. Crerror, Clinch & Company, of Chicago, owners of the lease of the Monitor, now Lamont mine, in this district, want the Shafer, and have offered inducements which are now under consideration, and will probably be accepted by the present lessees, says the "Diamond Drill." There is a stock pile of 25,000 tons to the credit of Messrs. Lindsay & Ross, which will probably go with the deal.

MINNESOTA.

Iron—Vermilion Range.

Explorations are to be resumed on T. J. Walsh's property, near Towner, says the Vermilion "Iron Journal." When work was discontinued last October, the test pit east of the Iron Range track was bottomed in 4 ft. of soft ore, which very much resembles in appearance that of the Chandler. So far as known, this is the third discovery of soft ore on the Vermilion Range. A small crew of six men will be employed at present. This property is about a mile directly south of the Minnesota mine, and for eight years has been tied up in litigation in the General Land Department.

Iron—Mesaba Range.

Shaw Iron Company.—This company has leased the W½ of SE¼ of 8.58-17 of the Security Land and Exploration Company. The royalty is 30 cents per ton and the minimum output 50,000 tons per year. The property is already developed, and the company expects to begin shipping ore during March.

Sheridan Iron Company.—This company has struck ore on the Rouchleau land, at a depth of 80 ft.

MISSOURI.

Jasper County.

(From our Special Correspondent.)

Joplin, Feb. 27th.

Saturday evening closed the most prosperous and active week in the mines of the lead and zinc belt of the present year. The zinc ore buyers were out in full force, and ready to take all ore offered. The price paid during the week was an average of $22 per ton, while choice claim lots of zinc ore brought $23. The market closed with an upward tendency. Lead ore remained steady at $21.75 per thousand. Following are sales from the different camps: Joplin mines, 2,207,550 lbs. zinc ore and 241,200 lead, value $29,429; Webb City mines, 1,099,830 lbs. zinc ore and 32,390 lead, value $12,568; Carterville mines, 2,057,120 lbs. zinc ore and 89,030 lead, value $24,520; Zincite mines, 264,560 lbs. zinc ore and 2,880 lead, value $3,035; Oronogo mines, 10,870 lbs. zinc ore and 108,690 lead, value $2,420; Carthage mines, 102,350 lbs. zinc ore and 57,500 lead, value $3,408; Galena, Kans., mines, 999,770 lbs. zinc ore and 1,010,000 lead, value $32,197; district's total value, $97,577; Aurora, Lawrence County, mines, 1,070,440 lbs. silicate, 462,000 lbs. zinc blende and 150,000 lead, value $14,113; Wentworth mines, 241,185 pounds zinc ore and 8,000 lead, value $2,580; lead and zinc belt's total value, $114,270.

MONTANA.

Jefferson County.

Treasure Hill.—A tunnel has recently been run into the hill 140 ft., striking a 3-ft. vein of hard carbonate ore carrying a high grade of silver and lead, assays running from $60 to $100 to the ton. All the representation work for 1892 and 1893 has been done, says the Marysville "Mountaineer," and there is considerable ore on the dump. The company is now drifting on the vein.

Lewis and Clarke County.

Great Falls Mining and Prospecting Company.—At a meeting of the directors of the Great Falls Mining and Prospecting Company the following officers were elected: President, J. A. Gockstetter; vice-president, A. J. Trigg; superintendent of mines, P. Murphy; general manager, Samuel Quail. The property, as far as developed, shows up well, and the lead now being worked assays high in copper, with considerable gold and silver. This lead is 12 ft. wide, and widens out as the tunnel progresses into the mountain.

Piegan Mining Company.—The contractor has drifted 60 ft. in the tunnel, and is now working on a well defined vein 3 ft. wide. The tunnel is in 600 ft. and is still being driven.

Meagher County.

Queen of the Mountains Mining Company.—At the annual meeting, held at Great Falls, February 23d, the following officers and directors were elected: President, W. W. Stanton; vice-president, W. F. Burgy; secretary and treasurer, A. J. Lowe; attorney, S. Stephenson; directors, J. A. Coram, W. W. Stanton, D. W. Beecher, A. J. Lowe and A. Kennedy.

NEVADA.

Storey County—Comstock Lode.

Belcher Mining Company.—The latest weekly official letter says: "On the 350 level the south drift from the west crosscut is in 66 ft. The face shows a mixture of clay, quartz and porphyry. West crosscut No. 2 on the same level is out 48 ft. The face is in porphyry and quartz, the latter giving low assays. The east crosscut is out 32 ft., with the face showing porphyry and quartz of low value. Considerable repairing has been done in the upper levels and to the shaft. We are daily hoisting about 20 tons of fair ore from the stopes immediately above and below the 300-ft. level."

Challenge Consolidated and Confidence Mining Companies.—Prospecting is going on in the upper levels. Some fair grade ore is being extracted, and is sent to the Brunswick mill for reduction.

Crown Point Mining Company.—The latest official weekly letter says: "The west crosscut from the southwest drift 150 ft. south of the shaft on the 400 level is out 315 ft. The material in the face is composed of porphyry, clay and quartz of low grade. There is no change worthy of note in the workings south from the raise above the fifth floor of the 160-ft. level west stope."

Justice Mining Company.—The latest weekly official letter says: "The south drift from the north stope on the 822 level is in 112 ft.; the face is in quartz assaying about $15 per ton. We are extracting from the north stopes 822 level, about eight tons of ore per day, the face samples from which go about $15 or $18 per ton. Have shipped to the Washoe mill during the past week for reduction 81 tons, 520 lbs. of ore, the average battery sample of which was $18.38 per ton. Have shipped to the United States Mint two bars of bullion of the assay value of $5,577.80."

Overman Mining Company.—The latest weekly official letter says: "On the 1,150 level the southwest drift from No. 3 upraise is out 59 ft.; formation, porphyry and quartz of a low grade. On the 1,100 level the southwest drift is out 80 ft.; formation, soft blue porphyry, with stringers of quartz. On the 1,050 level west drift from No. 5 upraise is out 80 ft.; formation, quartz of a low grade. On the 1,000 level

northwest drift is out 473 ft.; formation, quartz with bunches of porphyry. On the 600 level west crosscut No. 2 is out 239 ft.; formation, clay and prophyry."

Savage Mining Company.—The latest official weekly letter says: "During the week we have hoisted 400 cars of ore from the 1,100, 1,400 and 1,450 levels; shipped to the Nevada mill, 465 tons; milled, 465 tons; average car sample assay, $18.38; average battery assay, $17.77. Buillion yield for the week, $5,784. On the 950 level the north prospecting drift from the 8th floor of the old stopes is advanced 84 ft. in quartz and porphyry. This drift has been connected with an upraise from the sill floor of this level. On the 1,100 level we have started a north prospecting drift from the 16th floor and advanced the same 12 ft.; face is in quartz and porphyry. We are still stoping o e from the upper floors of this level. On the 1,300 level we are stoping south in the ore passed through by the west crosscut, 120 ft. south of the shaft. On the 1,400 level the east crosscut from the north drift, started 50 ft. north of the ore stopes, was advanced 28 ft., making its total length 64 ft.; face is in quartz and porphyry. On the 1,450 level we are stoping ore upwards from the end of the west crosscut, started 100 ft. from south boundary."

W. R. Eckart, the engineer secured by the pumping committee to obtain the data to be embodied in its report, said to a San Francisco 'Daily Report" representative: "An impression prevails that we can get our report on the feasibility of pumping out the lower levels of the Comstock ready in two or three weeks. This is wrong. Please inform the public that it will take two, and very likely three months, before we can lay the matter before the companies in proper shape. Our first work will be to ascertain how much water was being pumped from the lower levels years ago, when all the pumps were in operation, that is, when they were holding the water down in the bottom of the mines. We will also have to ascertain the cost of that work. To do that we will have to go carefully through all the old books and records. Then we will have to compute the quantity of water which now fills every shaft, winze, drift, crosscut and other openings in the entire lode, and make allowance for the inflow, the situation of the ground and the formation of underground lakes caused by caves. Having secured this data we will have to decide where the pumps can be placed so as to work to the best advantage, and then will come the question of what appliances it is best to use and the cost. Those I have enumerated are only a few details of our great work, and the public will see that we cannot do this in a hurried way. These and many other details secured we shall make up our report and then it is for the stockholders to judge whether it will be the best to pump or to allow matters to remain as they are."

Sierra Nevada Mining Company.—This company has discontinued work in the Kenosha tunnel. As soon as possible work will be resumed in the intermediate tunnel.

(From our Special Correspondent.)

The following is the weekly tabulated statement of ore extracted from Comstock mines and milled, with the car sample and battery assays, bullion shipments, etc.:

Mines.	Tons Hoisted	Car Sample Assay.	Tons Milled.	Average Battery Assay.	Bullion Product for Week.	Bullion Shipped.
Belcher	110	.....	....	.....	.....	.....
Con. Cal. & Va.	540	[1]26·37	705	23·41	.....	.....
Justice	161	.....	....	17·62	.....	[3]$5,557.59
Kentuck	21	[2]37·	....	.....	.....	.....
Potosi	490	22·64	527	22·53	.....	[4]239 lbs.
Savage	[5]400	18 38	465	17·77	5,784 60	....

[1] R. R. car. [2] Mine assay. [3] First shipment on present run. [4] Crude bullion. [5] Cars.

Hale & Norcross Mining Company.—No sooner had the Supreme Court given a decision adverse to the defendants in the celebrated suit, in the matter of the fraudulent bond, than an application was made, without notice to the plaintiff, for a stay of execution for thirty days. The matter was rushed through secretly, and necessarily, there being no opposition, the motion was granted. To-day (the 24th inst.) the defendants appeared before Chief Justice Beatty, of the Supreme bench, to submit a new bond. Several names were submitted and the matter went over until Monday to allow the plaintiff to make inquiries as to the standing of the parties in question. The two most important personages who have been induced to qualify on the new bond are the two daughters of the late W. S. Hobart, one of the original defendants in the suit. There is something pitiful in the position in which these young girls have been placed by Hayward and his allies. The elder girl is only 21 years of age, and the younger has only attained the legal age (18), a month or two ago. Unversed in business matters they confessed, when examined by plaintiff's counsel, that the step they were taking in qualifying on the bond in the sum of $2,000,000 had not been discussed by them with the legal advisors of the Hobart estate. They thought, however, they understood the responsibility they incurred. Attorney Baggett, plaintiff's counsel, appealed to the court, however, as to whether it was seemly, to say the least, that these young ladies should be permitted to go on a bond in such heavy amounts without having a clearer understanding than they evidently had regarding the responsibilities they were assuming without receiving advice from Messrs. Gaber, Boalt and Bishop, attorneys for the estate of their father. In the interim between now and Monday next they will reconsider their determination, under advice of their legal advisors The inventory of the Hobart estate has been filed this week, the total assets being valued at between five and six million dollars. Charity Hayward, wife of the most notable defendant, desires to qualify in the sum of $600,000. The splendid residence at San Mateo and other pieces of property are in her name, and consequently she will in all probability be accepted on the bond. C. W. Lane, Hayward's manager at the Utica mine, is down for the sum of $900,000, but it is doubtful if he can qualify in this amount. Dingee, a relative of Hayward, and a resident of Oakland, wishes to qualify in $600,000, but it is almost certain that unless he makes a better showing he will fail. His chief asset is stock in an Oakland water company, in which he is half owner. Little transpired during the hearing that was of interest, but on Monday the anticipations are that a sharp fight will be developed.

Keyes Mining Company.—A lien of $3,000, held by O. Loukey against the mine in Seven Mill Canyon was foreclosed this week by order of the District Court. A number of labor liens have also been filed against the property, thus involving the company in legal troubles from which it appears they cannot free themselves.

Occidental Mining Company.—An improvement has shown up in the mine during the week. Ten feet of pay ore has been cut in the winze, 750-level, which was previously cut in a south drift from the shaft. The ore assays high enough to leave something over after paying working expenses, and it has been found at greater depth than any found before. There is a probability of it developing into a valuable ore body.

NEW MEXICO.

Grant County.

Confidence Mining Company.—This company will build a large mill in the Silver Creek district this year. The company has been developing its group of mines for over three years, and now has a large quantity of ore blocked out. The mill will be built about two miles from the mines, and will be run by water power. The water will be brought to the mill in a flume over 3,000 ft. in length. This will be the only mill in this part of the territory run by water power, writes the Silver City correspondent of the New York "Sun." The ore is low grade, carrying both gold and silver.

Lone Mountain Mining and Milling Company.—This company shipped 3,100 ounces of silver on the 16th inst., the product of last week's run on second class ore from their mines at Lone Mountain. This shipment, says the Silver City "Enterprise," makes over 10,000 oz. shipped in the past fortnight by this company.

Lincoln County.

Old Abe Mining Company.—This company has nearly finished its new mill at White Oaks. It is expected that everything will be ready for the trial run within a few days. Fifty men will be employed in the mine and mill.

Vera Cruz.—This mine near Nogal has been bonded by Colorado capitalists. The company expects to have a 30-stamp mill in operation by May 15th. A 125-h. p. boiler and engine have been ordered. The old workings on the Vera Cruz, says the White Oaks "Eagle," have developed a large body of low grade gold ore, but it seems that recent prospecting on another part of the property has shown up lead of fine ore, the lowest assay being $10 per ton.

Sierra County.

The Standard smelter at Hillsborough is again in operation on copper ore from the Standard Company's mines. The ore is made into copper matte, in which form it is shipped. The matte carries some gold and silver.

The smelter at Kingston, which has been undergoing repairs, will be blown in again very shortly. There is but little doing in the camp now, but an effort is being made to consolidate three of the large mines there, and if this is accomplished the new company, it is said, will commence operations in the mines at once.

Silver Mining Company of Lake Valley.—This company, it is reported, will close down its mines indefinitely,

Socorro County.

Maud S.—A number of miners have been laid off in this mine at Mogollon, owing to the accumulation of ore. The ore bins at the mill, as well as the ore house, and all the available space in the mine, have been utilized for storage.

OHIO.

Athens County.

The Marietta Run Coal & Coke Company has been incorporated with a capital of $1,000,000, to mine coal and manufacture coke in Athens County, Ohio. The principal office will be in New York. The directors are: Clarence Stephens, Melvin Stephens, and Abraham G. Jennings, of Brooklyn; Francis Howland and James G. Gardiner, of New York City.

OREGON.

Josephine County.

(From our Special Correspondent.)

Grant's Pass Mining and Development Company.. Grant's Past.—Several thousand dollars have been expended in working the sand and gravel forming the bed of the Roque River. Pumps bring up the gravel, which is worked by the Benlap process, and so far a fair return has been obtained.

PENNSYLVANIA.

Coal.

An extensive cave-in took place on the 1st inst. at Morea. Several coal cars went down with the earth and are buried out of sight. A number of side tracks of the Lehigh Valley Railroad in the vicinity of the cave-in have settled several feet.

The rate of wages to be paid the miners employed at the Philadelphia & Reading Coal and Iron company's 50 collieries in the Pottsville region for the last half of February and the first half of March has been fixed at $2.64. This rate of wages is 5% above the $2.50 basis.

Wm. F. Harrity and Dallas Sanders, of Philadelphia, are at the head of a syndicate which has bought the Schuylkill Traction Company, whose road, 23 miles long, connects Locustdale, Ashland, Girardville, Shenandoah and Mahanoy City. The line will be extended to Centralia and Mt. Carmel, and will then connect about forty collieries in Schuylkill County.

The Schuylkill Coal Exchange has issued a circular dated Pottsville, February 28th, which shows the following colleries drawn to make returns of prices of coal sold in February, 1893, to determine the rate of wages to be paid, make the following returns:

Philadelphia & Reading Coal & Iron Company: Gilberton colliery, 2·739; Reliance, 2·629; Alaska, 2·561; Draper, 2·629; Locust Spring, 2·684. The average of these prices is 2·6488, and the rate of wages to be paid is 5% above the 2·50 basis.

In the production by the 41 collieries of the Second Anthracite district of 6,087,526.19 tons of coal last year, 3,381,839 89 tons of which were shipped, 14,071 men were employed, and 35 lives lost. Of the mines which worked steadily the Tripp working scored the best time, 255 days, and the Dickson colliery, Von Storch colliery and Providence shaft came next, having 232¾, 229¾ and 229 days respectively. In all, 202,192 kegs of powder were used, and 262 boilers, 15 locomotives and 1,873 horses and mules employed. The heaviest production of a single colliery is recorded of the Capouse, 280,229 tons. Next is the Dickson, which produced 273,471.14 tons. The Von Storch has 263,594.04 tons to its credit, and the Old Forge shafts 246,960 tons.

Mine Inspector Samuel Gay, of the Eighth Anthracite District, which embraces the 40 collieries in Schuylkill County, between Carbon on the east and Dauphin on the west, has completed his report for the year 1892. He reports 50 fatal accidents. Of this number 16 resulted from the explosion of firedamp; nine, falls of coal and roof; six, the handling of mine cars; two, machinery on the surface; one, falling down the slope; three, blasting materials; 10 drowning, and three miscellaneous. The number of fatal accidents last year shows a marked increase over those reported during the two previous years. During the year 1891 there were 28 fatal accidents, and in 1890 there were but 17. The coal produced during the year 1892 was 3,066,092 tons. In the way of improvements, Mr. Gay reports that during the past year the old Silverton colliery, at West West, was opened by a party of capitalists from Pittsburg and Scranton. The Chamberlain Coal company is developing the old Barty Bainbridge slope at Mill Creek. It is the intention of the company to either sink a new shaft or continue the old slope. A new breaker has been erected at the Silver Creek shaft, which is one of the largest in the county. It has a capacity of preparing from 1,000 to 1,500 tons of coal daily.

Lehigh Coal and Navigation Company.—At the annual meeting of this company, held in Philadelphia on the 28th ult., the following officers were elected: Joseph S. Harris, president; Edward W. Clark, Francis R. Cope, Charles Parrish, James M. Willcox, Edward Lewis, Samuel Dickson, Edward B. Leisenring, Abram S. Hewitt, Thomas S. McKean, Charlemange Tower, Jr., and Edward S. Buckley.

Loyalhanna Coal Company.—This company, near Latrobe, sustained a heavy loss on the 1st inst. by the caving-in of about 100 acres of its coal land. It is feared that a number of miners may be entombed, but there is no certainty of it.

Philadelphia & Reading Coal and Iron Company.—This company's statement, January, 1893, shows gross receipts, $5,319,113.10; gross expenses, $5,427,690.94 (including operating expenses, $5,353,482.14; colliery improvements, $67,546.21, and expenditures for permanent improvements, $6,662.59), thus showing a loss for the month from mining of $108,577.84. To this should be added $68,000 as one-twelfth of the current year's fixed charges, leaving a total deficit for the month of $176,577.84. For the first two months of the current fiscal year the deficit is $145,274.71. For the same period of 1892 there was a deficit of $49,414.99. The business of the Lehigh Valley and Lehigh and Wilkes-Barre departments is included in the statement for the year 1893.

Susquehanna Coal Company.—The strike of the miners at this company's colliery at Nanticoke was

ended on the 1st inst., the men accepting the company's offer of the wage scale of the Delaware, Lackawanna and Western collieries.

Oil.

It is reported that several good wells have been struck in the McDonald district during the week, one of which produced 1,200 to 1,500 barrels per day, but the total daily yield on Friday February 24th, was but 16,000 barrels, and it has not varied much from that quantity during the week. The results of drilling in that district this year show that only a further falling off in the production can be expected. From the highest figures of last year the decrease in this one district has been 44,000 barrels. In the older districts but little work in the way of starting new wells has been done, owing to severity of the weather and, even in the new districts, south of Wheeling, operations have been retarded by the same cause. As a rule, from this time of the year to May 15th, new work progresses very slowly on account of the condition of the roads, and unless something extraordinary should occur in the way of new territory, the number of wells drilling and new rigs up will show a further decrease during February, says "Kiernan." The pipe line runs do not indicate any material change in the total daily production of all the districts, but that of the older districts continues to gradually decrease. The production north and east of Macksburg has averaged since January 2d close to 76,600 bills daily, against about 95,000 barrels for the same time last year, or a decrease of 19,000 barrels daily. The stock has been further reduced. Accounts from the Western Ohio fields continue decidedly unfavorable to producers and the production has again declined. The exports of crude, refined, etc., from Atlantic ports from January 1st, to date have been 86,509,000 gallons; increase 12,642,000 gallons.

SOUTH DAKOTA.

Lawrence County.

Black Hills Gold and Silver Recovery Company.—This company made the third payment ($1,500) on the group of claims at Blacktail owned by Messrs. Flickinger, Lewis, et al. The fourth and final payment will be made March 20. The price to be paid for this property was understood to have been $40,000, in four payments. The property involved in the deal are the claims known as the Lewis, Little Nell, Blunderbuss, Treadwell and Dalton lodes.

Pennington County.

Welcome Mining Company.—Concerning the lease of this company's property to the Black Hills Mining and Smelting Company, the Black Hills "Times" says: "Nearly a year ago the Welcome Mining Company leased its mine to the Black Hills Milling and Smelting Company, of which Wm. Dunn, of Chicago, and R. H. Thorburn are principal owners, for a period of 15 years. The latter company then built a fine chlorination plant at Rapid, which has not worked as well as it should. This company has not lived up to the contract with the Welcome Company in many particulars. The contract provided for peaceable possession, should the milling company fail to perform its part of the contract, and several weeks ago notice was given that possession would revert to the Welcome Company. On February 24th Albert J. Malterner, secretary of the company, took possession of the mine and locked it up. There were 20 men employed in the mine, who left the works without any words, but are being retained."

UTAH.

Bromide.—A rich strike is reported at this mine in the Henry mountains.

Queen of Sheba Gold Mining and Milling Company.—This company has been incorporated at Salt Lake to operate mines in the Spring Creek district. Capital stock is $500,000. The officers are Thomas C. Rooklidge, president; Albert Shaw, vice-president; John W. Rooklidge, secretary and treasurer.

Juab County.

Bullion-Beck Mining Company.—The company expects to resume operations early in March, and thinks it will have no difficulty in securing all the men needed, but according to the Salt Lake "Mining Journal" the miners state that none of their number have agreed to accept the company's proposition, and the resumption of operations is still doubtful.

Diamond Mining Company.—During January the north drift from the 400 ft. level was driven a distance of 86 ft. by two 10 hour shifts. This is the best work ever made in the district so far as known, says the Salt Lake "Mining Stock Journal."

Mercur Mining Company.—It is reported that a body of $28 ore has been found on this property.

Millard County.

A vein of gold ore assaying at outcrop about $50 per ton has recently been discovered on the south side of Quartz Hill, says the Salt Lake "Herald." The vein was found under an 8-in. capping of white spar and between two lime ledges. It is 14 in. thick.

Salt Lake County.

The recent new strikes on Carr Fork are reported to be improving.

Mammoth Mining Company.—A shipment will be made as soon as the roads open.

Summit County.

Anchor Mining Company.—There was a rumor on the street this week to the effect that the mine would start up with a full force on the 1st of March, but according to the Park City "Record" nothing definite in that direction has yet been decided upon, and it is not yet known just when the present force will be increased. The future course of the property depends on the price of silver and lead.

California.—Work on the new tunnel at this mine is progressing rapidly and it is expected that the vein will be reached early in the spring. The future of the property depends on the developments made by this tunnel.

Uintah County.

The proposed leases of the mineral lands on the Uintah and Uncompahgre reservations will not be executed. The Secretary of the Interior decides that such leases are not authorized by law and cannot be ratified.

VIRGINIA.

Craig's Creek.—The McClinton iron mines have been leased to W. A. Charlton and others, who are making preparations to mine and ship ore.

Mathieson Alkali Works.—This company has been formed, says the Roanoke "Times," to develop the salt deposits at Saltville, near the line of the Norfolk & Western Railroad. It will spend $1,000,000 in erecting the second largest soda ash and bleach plant in the United States. Its product when in full operation will be 50,000 tons of soda ash and bleach per annum. The property purchased by the new company contains several square miles. It will take from six months to a year to get the plant in operation.

Victoria Iron Mines.—These mines in Rockbridge County have made arrangements to increase the output from 150 to 300 tons daily. The ore will be shipped to Rockbridge furnace.

WASHINGTON.

Pierce County.

(From our Special Correspondent.)

B. L. & A. Reduction Company, Tacoma.—The company has recently made some experiments in reducing ores by electricity which have proven satisfactory. Pig iron of superior quality was made within 30 minutes from the time the furnace was charged, and with precious metal-bearing ores equally satisfactory results were obtained. A large plant is to be erected and already small lots of ore have been forwarded from different mining sections.

Whatcom County.

(From our Special Correspondent.)

Fairhaven Land Company, Fairhaven.—This company propose building a number of coke ovens at their coal mine, a few miles distant from the town. At present the coal output is 60 tons per day, but this is to be increased almost immediately.

WEST VIRGINIA.

Ritchie County.

A big oil well was struck on the 27th ult. on Buck Run, five miles from Pennsboro, at a depth of about 1,750 ft. The oil is running at an estimated rate of 1,000 bbls. per day, and is pouring into the stream and running away.

WYOMING.

(From our Special Correspondent.)

Silver Crown District, Fremont County, is coming to the front after several years of quiet on account of some late developments. One company has opened two large veins of iron sulphide ores on its property, one 20, the other 24 ft. in width between porphyry and syenitic walls. The ore concentrates nicely ten into one, carrying three to ten dollars in gold per ton of crude ore. Should these veins persist in carrying values with depth, the company propose to erect a large mill early next season to include mechanical desulphurizing furnaces, expecting to matte the roasted ore and to market it to smelter in Denver. This plant will be run by water power.

FOREIGN MINING NEWS.

MEXICO.

(From our Special Correspondent.)

Canadian Mining Company.—A bullion shipment, valued at $51,000, has been received at San Francisco.

It is reported, says "El Minero Mexicano," that the government is considering the reduction of the taxes on mining claims from $10 to $5 per claim (perteneciente). La Camara Minera de Oaxaca is championing the reduction, and if earnestly supported by the other mining states it will probably be adopted.

Chihuahua.

Batopilas Mining Company.—From the report of General Manager A. H. Shepherd for 1892, it is learned that the mine workings from July 2, 1892, to Jan. 1, 1893, were 5,021 ft., and the value of the product for the same period was $312,788. The year's operations were: Value of product, $627,423; betterment outlay, $227,572; running expenses, $205,103; paid rent, $194,746; total, $627,423.

The various properties are reported on as below:

Aqueduct.—Work on the aqueduct has been continued. I have great hopes of letting the water in by July next, when I hope the turbines will be in place.

Camuchin.—Connection has been made between San Antonio and the vertical vein. Good silver is being taken out from the San Judas working, which has been sunk to a depth of 30 ft. below tunnel level and two fronts are being driven on the same. Work is also going on in No. 5 and No. 6, which have continued to yield silver, though in small amounts.

Cinco de Mayo.—Work has been resumed in this mine after a long suspension. The acquisition of the Todos Santos properties has made possible a connection from Cinco de Mayo to their lower tunnel. The crosscut has been driven about 75 ft., and lacks about 30 ft. of connection. Another working in silver has been going on in the east side of the property, and this working has more than paid the expenses of the crosscut tunnel, and will be enlarged and extended as circumstances permit.

Descubridora.—Steam hoists and track have been put in, shaft straightened and opened to a depth of 200 ft. The hoist is ready for work.

Hacienda San Miguel is in fair condition and working satisfactorily. I have increased the value of the charges of roasted metal from 80 to 200 oz. The loss in either case is low, and we can get out double the quantity of silver with the same amount of fuel.

Porfirio Diaz Tunnel.—The tunnel now has a depth of 2,685 ft. The Aurora air shaft had been sunk to the tunnel level in September. Mr. Brodie has made a final survey of the two properties and projected a crosscut from the end of the tunnel, 2,635 ft. from front to air shaft, calculating to cut the latter at 27 ft. from the tunnel. This cut was started on January 8th and on January 24th the shaft had been cut at 24 ft. from the tunnel.

Roncesvalles and Todos Santos.—Todos Santos has been the principal dependence during the past six months, and has yielded a large amount of ore of fine quality. The workings below the tunnel level have reached a depth of 300 ft., and the cost and difficulty of taking out the ore have necessitated the placing of a steam hoist here. Roncesvalles has been furnished with a hoist, boiler, etc. No. 2 shaft is completed and has the track in it to a depth of 225 ft., with stations and crosscuts. A good showing of silver in the veins is apparent. The crosscut tunnel had on January 10th progressed 200 ft., and was being driven to connect the Todos Santos vein. It is expected that this will furnish a large amount of good ground for exploration. In the upper northern tunnel, Obra Morris, work on S. Domingo is in progress and there are indications of a good yield here.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo.; Baltimore, Pittsburg, Deadwood, S. Dak.; St. Louis, Helena, Mont.; London and Paris, see page 216.]

NEW YORK, Friday Evening, March 3.

A very quiet and uneventful week has been spent in the mining stock market. There has been no marked change in values, but the volume of business has been even smaller than usual. During the past week (including Saturday) only 12,150 shares were sold. Of this number more than one-half was made up of transactions in three stocks: Monte Cristo, Comstock Tunnel and Brunswick Consolidated.

The Comstocks were very quiet, and generally show no improvement whatever. Comstock Tunnel was the most active, and shows sales of 2,200 shares at 11@13c. News of interest concerning this company will be found elsewhere in this issue. Of Best & Belcher 150 shares were sold at $1 65@$1.70. Chollar was stationary at 65c. with sales of 200 shares. There was a solitary sale of 200 shares of Consolidated California & Virginia at $2.90. Hale & Norcross was very quiet, only 200 shares being sold at $1.25@$1.30. Other sales were as follows: 100 shares of Gould & Curry at 95c.; 200 shares of Ophir at $2.10@$2.35; 100 shares of Savage at $1; 200 shares of Yellow Jacket at 50@65c.; 200 shares of Mexican at $1.75@$1.95.

Of the California stocks, Bodie Consolidated shows a sale of 100 shares at 20c., and Bulwer one of 200 shares at 15c. Of Quicksilver, common, 300 shares changed hands at $3. There was a sale of 100 shares of Standard Consolidated at $1.40. Transactions in Brunswick Consolidated aggregated 1,300 shares at 7c. The superintendent of the Brunswick Consolidated Gold Mining Company, writing from Grass Valley, under date of 22d ult., says: Work has been going on steadily during the past week. The 700 east drift has been run 6 ft., the west drift on the same level 7 ft. There is no ledge in the east drift at present, but the ground is changing, and I think we shall have quartz soon. In the west drift we have a stringer, from 4 to 6 in., of good looking ore, which I hope will soon show gold.

Application for listing stock on the Consolidated Stock and Petroleum Exchange has been made by the Albany Gold Mining Company. This company is the consolidation of the Middle Bar, Astoria, Hollywood and Littlefield mines, and was incorporated under the laws of California on July 12th, 1892. The capital is $1,000,000 divided into 1,000,000 shares of $1 each. The stock is assessable. The property of the company is located in Jackson, Amador County, Cal., and consists of the Littlefield, Elephantine, Merrimac, Astoria and Middle Bar claims, each 1,500×600 ft. The former owners expended $30,000 for mine development and $2,000 for milling ma-

chinery, buildings, etc. The present company has no debts and has $6,000 cash in the treasury. The officers are: John Henderson, president; W. F Trotter, vice-president; F. E. Lutty, secretary, and H. R. Lounsbery, treasurer. There are about 200 stockholders.

Of the Colorado stocks we note sales of 500 shares of Chrysolite at 22c.; 300 shares of Leadville Consolidated at 19c., and 500 shares of Lacrosse at 4c.

There was a sale of 100 shares of Alice at 50c.

Phœnix of Arizona was very quiet—only 300 shares being sold at 15c.

Sales of Monte Cristo this week were 4,200 shares at $3.25@$3.55, and of El Cristo 300 shares at 45c.

Boston. March 2.

(From our Special Correspondent.)

There is not much change to note in the outlook for copper stocks. The market continues to rule dull, with prices barely steady and nothing in sight at present to indicate an upward movement. There was some inquiry for Centennial to-day and it is reported that good news from the mine was the moving cause; whatever it was the buying orders advanced the price from $8 to $9¼ and it closed quite firm. Tamarack Jr. was also in better demand and sold up to $19, an advance of $1.

The Montana stocks as usual furnished the bulk of transactions, and prices were fairly maintained. Boston & Montana sold at $32½, declined to $31½, and recovered to $32. Sales about 1,500 shares.

Butte & Boston declined ¼ to $10, but at this price all of the lots offered were taken, and it closed at $10¼, same as last week.

Calumet & Hecla declined from $305 to $300, but recovered the decline on the latest sale, which was, however, for only five shares.

Tamarack declined from $161 to $158, and rallied again to $160 for 40 shares.

Quincy declined from $136 to $130 on small sales. Tha output for February was 700 tons against 500 tons in 1892 and 326 tons in 1890. The prospect of the mine the coming year would seem to warrant higher prices for the stock.

Osceola holds steady between $35 and $36, with a good demand for it at about $35½.

There is a good inquiry for Franklin at $12¼, with sales at this price and at $13.

Kearsarge was dealt in only in a small way and declined from $11 to $10½.

Wolverine sold at $2¾ and $2½, Allouez at 75c., Arnold at 50c. and Mesnard at 50c.

A small lot of Atlantic sold at $10.

3 P M.—Butte & Boston advanced to $11 this afternoon and a single share of California & Hecla sold at $310. Others unchanged.

Colorado Springs Stock Market.

(Special Report by Sherwood Aldrich.)

The stock market of this city was active throughout January. The principal dealing was in Anaconda, Mollie Gibson, Lemhi, Pharmacist, Isabella and Work. The volume of business was large, a total of over one million shares of mining stock being sold.

The announcement early in January that the Anaconda company had secured the contribution asked for from the stockholders to release the properties from debt, acted as a strong stimulant to the market. Anaconda rose swiftly from 19c. to 26c., and from that figure to 42c., the buying being very strong. It reacted, however, very sharply, to 30c., at which point it lingered for some days, then gradually strengthened, until it is now quoted strong. Work upon the properties is to be resumed early in March under the management of mining men in whom the entire State of Colorado has great confidence. Hon. Irving Howbert, one of the directors of the company, will devote much time to a care for the company's interests. When it is considered that the company owns almost a mile of territory on which the Anaconda vein has been uncovered, and that this vein, while generally of low grade, is very extensive, the real value of the stock may be appreciated. The resumption of work upon the properties will probably give further strength to the stock.

Mollie Gibson was comparatively quiet. The uncertainty as to the future of silver accounts for the low prices at which the stock is selling. It dropped as low as $7.10 in January, and is now held at $7.90. The other Aspen stocks act in sympathy, Argentum Juniata having sold as low at 53c., but closing at 63c. This stock, however, seems to have an upward tendency at present, caused by a fair demand and very slight supply.

The passing of the Pharmacist dividend early in January caused a sharp decline in that stock. In the excess of selling the price fell from 27c. to 16½c., but reacted in a few days to 20c., and rose steadily with the news that dividends would be resumed as soon as the roads were cleared of snow to permit ore hauling. On the 3d inst. it was announced that a dividend of 1c. would be paid in February, and the stock rose to 29c. bid and 30c. asked, at which it closed.

Isabella, the new stock which includes the properties owned by the B. V. and Bull Mountain companies, of Cripple Creek, was active. Declining in January to 15c. on the rumor that a reorganization, with a smaller capital stock, would soon be made, it strengthened on the denial of that rumor and closes at 20c. Work stock scored an advance from 5½c. to 10c., and is now selling at 8½c. It is probable that a new management will take charge of this property after the annual meeting of the stockholders in April, and that what are excellent mining properties will be developed by more competent mining men.

The news from the Cripple Creek camp has been very favorable. Development is being pushed to gain depth on the ore bodies, and in no instance has it been found that the veins of the camp "pinch" in the lower workings. Nothing has yet appeared to indicate a limit to the possible output of this great gold camp.

San Francisco. Feb. 24.

(From our Special Correspondent.)

To-day Mr. Mackay was to have left the city for the Comstocks, and upon his return it was expected that arrangements would be completed for making the various changes contemplated, by which it would be possible for all the companies operating on the lode to unite in drainage operations. Instead of this, however, the head of the bonanza firm lies on a sick bed, the victim of an irresponsible crank. As usual in such cases the stock market is responsible for the perversion of this man's intellect.

This afternoon an effort was made to break down the north end Comstocks, and the chipping fraternity would have made a coup if the attempt had resulted, as they hoped, in a stampede. Consolidated California & Virginia was forced down, however, only to $2.75, the previous selling price having been $2.95, when all offerings were snapped up; the ruling price in the "big" board being $2.85, at which price it closed steady. Ophir opened at $2.25; Mexican at $1.90; Sierra Nevada at $1.35, and Union Consolidated at $1.15, each of these closing a point off.

In the middle group of Comstocks Best & Belcher ruled at $1.75, an advance of 15 cents on the week's trading. Chollar has been steady at 55 cents; Gould & Curry at $1; Hale & Norcross at $1.30; Potosi at $1.35, and Savage at $1.

In the Gold Hill and South End stocks slight advances have been made during the week with the volume of trade larger than a week ago. Belcher sold to-day for 80 cents; Bullion for 55 cents; Caledonia for 5 cents; Challenge for 20 cents; Crown Point for 50 cents; Justice for 20 cents; Confidence for $1.50; Consolidated New York for 30 cents; Exchequer for 5 cents; Kentuck for 20 cents; Lady Washington for 5 cents; Occidental for 15 cents; Overman for 35 cents, and Yellow Jacket for 60 cents.

The outside stocks continue to occupy the background, barely a quotation having been obtained during the week. Bodie Con. and Mono are being held for 10 cents; Bulwer Con. 15 cents bid.

Of the Tuscaroras, Belle Isle, Del Monte and Navajo are being held for 10 cents; Grand Prize, North Belle Isle and North Commonwealth for 5 cents.

In the Quijotoa group Crocker, Peer, Peerless and Weldon are held for 10 cents, with no bidding.

At the close of the market there was a slight shading off in values, ranging from one to two points.

SAN FRANCISCO, March 3d (*By telegraph*).—The opening quotations to-day are as follows: Best & Belcher, $1.50; Bodie, 5c.; Belle Isle, 10c.; Bulwer, 25c.; Chollar, 45c.; Consolidated California & Virginia, $2.45; Eureka Consolidated, $1.50; Gould & Curry, 80c.; Hale & Norcross, $1.05; Mexican, $1.65.; Mono, 5c.; North Belle Isle, 15c.; Navajo, 15c.; Ophir, $1.90; Savage, 70c.; Sierra Nevada, $1.15; Union Consolidated, 90c.; Yellow Jacket, 50c.

DIVIDENDS.

Standard Consolidated Mining Company dividend No. 81, of 10 cents per share, $10,000, payable March 24th, at the Farmers' Loan and Trust Company, New York City. Transfer books close March 14th and reopen March 26th.

MEETINGS.

Delbi Mining Company, at the office of the company, Room 11, No. 14 Sansome street, San Francisco, Cal., March 8th, at 10 A. M.

Hale & Norcross Silver Mining Company, at the office of the company, Room 26, Nevada Block, No. 309 Montgomery street, San Francisoo, Cal., March 8th, at 1 P. M.

Park & Lacy Company, at the office of the company, No. 21 and 23 Fremont street, San Francisco, Cal., March 7th, at 1 P. M.

Potosi Mining Company, at the office of the company, Room 79, Nevada Block, No. 309 Montgomery street, San Francisco, Cal., March 8th, at 1 P. M.

METAL MARKET.

NEW YORK, Friday Evening, March 3, 1893.

Prices of Silver per Ounce Troy.

Feb.	Sterling Exchange.	London Pence.	N. Y. Cents.	Value of sil. in $1.	March.	Sterling Exchange.	London Pence.	N. Y. Cents.	Value of sil. in $1.
25	4·88	38 1/16	83 5/8	·635	1	4·87 1/4	38 3/8	83 5/8	·633
27	4·87 3/4	38 1/16	83 5/8	·635	2	4·87 1/4	38 3/8	83 5/8	·633
28	4·87 1/4	38 3/8	83 3/4	·635	3	4·87 1/2	38 1/16	83 3/4	·634

Silver continues to be quiet without any special feature. Inquiry from abroad continues and shipments are made in moderate quantities. The recent address of Mr. Gladstone is an indication that England still looks to America to take the initiative in proposals on the silver question.

The United States Assay Office at New York reports the total receipts of silver for the week to be 176,000 ounces.

Government Silver Purchases.

The government has purchased during the week the following quantities of fine silver at the accompanying prices per fine ounce:

February 27th, 25,000 oz., at 83·99c.

For the month total purchases were 4,162,000 oz.

March 1st, 719,000 oz., at 84c.

Gold and Silver Exports and Imports at New York for Week Ending February 25th, 1893, and for Years from January 1st, 1893. 1892.

	Gold.		Silver.		Excess of
	Exports.	Imports.	Exports.	Imports.	Exports.
Week....	$5.093.001	$421,032	$337,137	$34,437	$4,974.669
1893.....	25,852,568	553.789	4,573,339	515,166	29,338,102
1892.....	5,456,348	2,516,662	4,177.139	251,024	6,865,801

During the five days ending March 3d the exports and imports of the precious metals have been as follows: Exports: gold, $680,280: silver, $474,285. Imports: gold, $421,719: silver, $192,544. The gold exported went to the West Indies and South America; the silver, of which $278,000 consisted of American bullion, went to England. Of the imports 403,370 consisted of foreign gold coin, which was re-exported to Havana.

NOTES OF THE WEEK.

The silver men have had their way and the amendment introduced by Senator Sherman empowering the Secretary of the Treasury to issue 3% bonds has failed to become a law.

The Act of January 14th, 1875, commonly known as the Resumption Act, authorizes the Secretary of the Treasury to issue either of the descriptions of bonds specified in the Funding Act of 1870, viz., 5% bonds running for ten years, 4½% bonds for 15 years or 4% bonds for 30 years. If any of these classes of bonds be issued they can only be retired before maturity by purchase in the open market.

Meanwhile, the free gold in the Treasury grows less week by week, and next week it will disappear entirely unless exchange bills are offered in larger volume than hitherto. There is as yet no sign of abatement in the exports of gold, and as we are approaching the time of the year when large shipments are customary there would seem to be no reason to expect a falling off for some time to come.

In regard to the causes of this outward movement there seems to be a wide difference of opinion, some financiers ascribing it to the premiums paid by France and Austria, others blame the Silver Purchase Act, while still others say it is caused by a low balance of trade.

All of these have undoubtedly exercised an influence upon the outward movement; especially is this true of the low balance of trade now in our favor, but there are certain other facts to which but little attention has been paid, and yet which explains the present condition of affairs completely. Primarily the United States is a great debtor country and must annually pay to Europe not less than $40,000,000 in dividends and interest. Secondly, the freight on our imports, most of which is paid to foreign vessels, amounts to about $40,000,000 yearly; and, last, allowance must by made for the unknown but very large sum spent by Americans abroad. These items aggregate at least $140,000,000 and as the balance of trade in our favor for the fiscal year 1893 to date is but $42,000,000 it can readily be seen that large exports of specie are necessary.

The report of the British Delegates to the International Monetary Conference was issued February 14th as a Parliamentary paper.

In regard to the views expressed by some of the delegates that a plan may be adopted at the May meeting the report says: "For ourselves we are unable to share these hopes. It appeared to us that the discussions had shown such divergence of interests that there was little prospect of an agreement after an interval of a few months. We did not, however, think it politic to oppose a wish generally entertained by the Conference, . . . and therefore urged that under no circumstances should the Conference be called except for the consideration of a definite proposal emanating from the United States or some other government."

In regard to the various plans submitted to the Conference the report says:

"One great difficulty which was experienced in regard to these proposals was that in each case they were thought to involve disproportionate sacrifices on the part of certain countries. This is perhaps inevitable; but it is a most serious obstacle to the adoption of any compromise." To this we reply that the plan proposed by the ENGINEERING AND MINING JOURNAL involves no sacrifices on the part of any government; on the contrary once established it could not fail to benefit all countries which were a party to it. The report is signed by C. W. Premantle, W. H. Houldsworth, C. Revers Wilson, B. W. Currie and Alfred de Rothschild. Mr. W. H. Houldsworth also signed a minority report in which

he states that he is more sanguine than his confreres of ultimately obtaining an international agreement.

On February 28th Sir Henry Mevsey Thompson moved in the House of Commons that the British Government use its influence to bring about a reassembling of the International Monetary Conference, with the object of finding a remedy for the evils attendant upon the divergence of value between gold and silver. His motion was supported by Mr. Samuel Montagu, the head of the well known banking house of that name. Mr. Gladstone in reply said that "half of the powers at the Conference had shown that they leaned toward bimetalism, but that none had given an indication of what change they were willing to make."

Sir William Harcourt, Chancellor of the Exchequer said "the failure of the Conference was due to the absence of all definite proposals." The motion was finally rejected by a vote of 229 to 148, but the vote shows a great change of opinion in favor of some increased use of silver.

The monthly report of the director of the mint shows that during the month of February there were coined 183,000 pieces of gold, value $2,960,000. Of silver 1,876,000 pieces, value $914,000. Minor coinage, 5,116,000 pieces, value $86,600.

Domestic and Foreign Coin.

The following are the latest market quotations for the leading foreign coins:

	Bid.	Asked.
Mexican dollars	$.65¾	$.66½
Peruvian soles and Chilian pesos	.60	.61
Victoria sovereigns	4.86	4.88
Twenty francs	3.86	3.89
Twenty marks	4 74	4.78
Spanish 25 pesetas	4.80	4.85

Copper.—The market has again been very dull, very little business doing. Quotations remain unaltered at 12c. for Lake, 11@11¼ for casting and 9·85 for Arizona pig copper. Most of the producers of the last named are now out of the market.

From consumers we hear that they have a fair quantity of orders in hand, but all complain more or less of the prices realized for their manufactures.

In Europe the tendency has been somewhat firmer, although this is hardly shown in the prices of G. M. B. copper, which are closing at £45 10s. for spot and £46 for three months prompt. Refined and manufactured we quote as follows: English tough, £47 10s.@ £48; best selected, £48 10s.@£49; strong sheets, £57@ £58; India sheets, £53@£53 10s., yellow metal sheets, 4½d.

There has been quite a good demand for fine copper and contracts of fair magnitude have been placed. Statistics, too, show a considerable improvement, and visible supplies have decreased during the second half of February, to the extent of 2,700 tons.

The exports of copper from the port of New York during the past week were as follows:

To Liverpool—	Copper Matte.	Lbs.	
S. S. Majestic	699 bags	80,610	$4,000
" Nomadic	2,859 bags	325,775	14 000
" Aurania	3,901 bags	298,579	25,000
To Liverpool—	Copper.		
S. S. Aurania	195 pigs	62,039	$18,090
To Bremen—	Copper.		
S. S. H. H. Meir	168 pigs	58 772	$5,000
" "	40 bbls	50,000	6,000
To Havre—	Copper.		
S. S. La Normandie	753 pigs	227,202	$22,060

Tin has been adversely influenced by the various rumors regarding the repeal of the prospective duty current during the week. When, the other day, the House passed the repealing act, the market here remained fairly steady, but the reports which were cabled to Europe were evidently misunderstood, causing a decline of about £1 10s., and this could not fail to react here. Meanwhile, it has become known that the Senate Finance Committee has definitely declined to consider the bill, and the matter is therefore settled as far as this Congress is concerned. At the end of the week the feeling is quite firm, although only a moderate business is doing. Prices opened firm at 20½, but afterward declined to 20·30 closing at 20·40 for spot and 20 50 for April and 20⅝ for May and June.

The London market opened firm with sellers at £93 but afterwards declined to £92, closing higher at £92 7s. 6d. for spot and £92 17s. 6d. for three months prompt. Statistics show a decrease in visible supplies during February of 400 tons and although shipments from the East will probably be heavy during this month, quite a material falling off later on is expected.

In the interests of all concerned in the trade, it is greatly to be desired that the present uncertainty be removed.

Lead is rather easier here and some sales have been made at 3·90 and 3⅞, at which prices there is decidedly more desire to buy, and the largest seller being out of the market we have now to quote 3·92½. Remarkably little lead is being offered for sale.

In the foreign market, the opposite state of affairs exists. Offerings continue to be very heavy, but after the low-water mark of £9 5s. was reached the other day buyers for very large quantities came out and the price quickly rose to £9 15s. for Spanish and £9 17s. 6d for English lead, and these are the closing quotations.

Chicago Lead Market.—The Post Boynton, Strong Company telegraph us as follows: Market dull at $3.72½, with only small sales. The general trade is very quiet, with the consumers apathetic and looking on.

St. Louis Lead Market.—The John Wahl Commission Company telegraph us as follows: Lead is on the down grade with free sellers at $3.65 and the demand unusually light. Buyers are holding off for still lower prices.

Spelter.—This metal remains rather dull and sales have been made at 4·27½ New York. Just now the production evidently is in excess of consumption.

The foreign market is better and prices have advanced to £17 5s. for ordinaries and £17 12s. 6d. for specials.

Antimony is decidedly firmer, especially for the lower grades; Cookson's is still quoted at 10¾, L. X. at 10@12, while Hallett's has been advanced to 10½, with very few sellers even thereat. Most of the English refiners are sold out for three months to come.

Nickel prices are unchanged, but there are signs of an improved demand.

Quicksilver.—This market continues very quiet. Quotations are: New York, $38@$38.50; London, £6 7s. 6d.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, March. 3, 1893.

Pig Iron Production During Weeks Ending February 25th, 1892, and February 25th, 1893, and During Both Years to These Dates.

Fuel used.	Week ending Feb. 25, 1892.		Week ending Feb. 25, 1893.		From Jan., '92.	From Jan., '93.
	F'cs.	Tons.	F'cs.	Tons.	Tons.	Tons.
Anthracite.	94	38,970	70	32,600	311,760	261,200
Coke.	164	138,990	137	131,600	1,111,920	1,052,800
Charcoal	55	11,820	39	8,900	94,560	71,200
Totals	313	189,780	246	173,100	1,518,240	1,385,200

Prices: Southern, ex-steamer No. 1 F., $15.26; No. 2 F., $14.26; No. 3 F., $13.76; Gray Forge, $13 01, Northern, tide-water, No. 1 X, $15; No. 2 X, $14; No. 2 plain, $13.50; Gray Forge, $13. Southern irons are quoted, nominally, 26c. higher than Northern.

Spiegeleisen and Ferromanganese.—There is nothing doing in either ferro or spiegel. The market continues dull and featureless. Quotations are: Ferro, $56.25@$56.75; Spiegel, $25.50@$26.

Steel Rails.—The price remains $29 at tidewater.

Rail Fastenings.—Prices rule as follows: Fish and angle plates, 1·55@1·65c. at mill; spikes, 1·90@2c.; bolts and square nuts, 2·40@2·70c; hexagonal nuts, 2·70@2·80c, delivered.

Merchant Steel.—A slightly improved demand is reported and prices are a shade firmer. Quotations this week are: Mushet's special, 48c.; English tool steel, 15c. net; Americal tool steel, 6½@7½c; special grades, 13@18c.; crucible machinery steel, 4·75c.; crucible spring, 3 75c.; open hearth machinery, 2·25c; open hearth spring, 2·30c.; tire steel, 2·25c.; toe calks, 2·25@2·50c; first quality sheet, 10c.; second quality sheet, 8c.

Structural Iron and Steel.—There has been a fair inquiry for structural iron and steel during the week and several sales are reported, though with a single exception contracts have not been large. We quote: Beams, 2·3@2·55c, except for 20-in. beams, which are 2·75c.; angles, 1·95@2·15c.; sheared plates, 1·90@2·10c.; tees, 2·30@2·60c.; channels, 2 35@2·50c., universal plates, 2@2·10c.; bridge plates, 2@2·10c.; steel hoops, 1·90@8c. All on dock.

Buffalo. March 1.

(Special Report by Rogers, Brown & Co.)

Pig Iron.—The market continues slow with a large supply of iron offering, but without noticeable pressure to sell. Reductions in freight from the West and Southwest, coupled with a return to last fall's prices, have opened the way for an increased sale of Southern iron, and a re-instatement of that trade which was largely cut off by the advance at that time. On the other hand, local furnaces are greatly hampered by heavy eastbound freight advances which have been imposed since December by roads leading out of Buffalo and Niagara River points. We quote below on the cash basis f. o. b. cars Buffalo: No. 1 X foundry strong coke iron, Lake Superior ore, $14.50; No. 2 X foundry strong coke iron, Lake Superior ore, $13.75; Ohio strong softener, No. 1, $14.50; No. 2, $14; Jackson county silvery, No. 1, $17@$17.30; No. 2, $16.30@$16.80; Lake Superior ore charcoal, $17.25; Tennessee charcoal, $18; Southern soft, No. 1, $14; Alabama car wheel, $19; Hanging Rock charcoal, $20.50.

Chicago. March 2.

(From our Special Correspondent.)

Apparently the enforced economics and conservative management which have prevailed among Northern blast furnace men have combined to put them in a safe position. This is especially true of Western producers, and values generally are so low that, barring unlooked-for complications, any changes which may crop out in the near future should be an improvement rather than the reverse. Already some of the larger manufacturers of coke iron in this district have discounted the expected lower prices on ore, which, together with the steady decrease in output and increase in consumption, should soon bring about a change for the better. Anyhow, consumers cannot use the stereotyped complaint of over-production as an argument to hammer down prices. February was a good buying month, and the present month will not, it is believed, fall far short of it as regards coke iron, and more activity is looked for in Lake Superior charcoal. Finished material generally shows little change. Plates and sheets are quiet, though a better inquiry is noted for the latter. The outlook for structurals is excellent, especially for elevated railways, and steel rails are in better inquiry.

Pig Iron.—The fair amount of activity noted for local coke iron in our last review has been sustained by renewed purchases, and the aggregate tonnage has been good, making the month of February show nearly 50 per cent. greater sales than for the corresponding month last year. The deliveries also have have been considerably in excess of February 1892, indicating that, notwithstanding low prices, a healthy and hopeful market. Southern coke iron of the lower grades is in fair demand with prospects of improving inquiry. There have been no large orders placed during the past week, but many furnaces manifest a disposition to grant concessions for large business and large delivery, and several sales have gone through at low figures. Indeed a slight decline would not disappoint all parties interested—furnace agents and buyers. Lake Superior charcoal iron is quiet, but sellers anticipate a revival during the month, and there is no weakness in prices.

Quotations per gross ton f. o. b. Chicago are: Lake Superior charcoal, $16.50@$17.25; Lake Superior coke, No. 1, $13.50@$14,50; No. 2, $13.00@$13.50. No. 3, $12.75@$13; Lake Superior Besseme, $14.25; Lake Superior Scotch, $14.25@$14.75; American Scotch, $16.25@$16 75; Southern coke, foundry, No. 1, $14.25; No. 2, $13.35; No. 3, $13.00; Southern coke, soft, No. 1, $13 35; No. 2, $13.00; Ohio silveries, No. 1, $16.50; No. 2, $16.00; Ohio strong softeners, No. 1, $16.75; No. 2, $16.25; Tennessee charcoal, No. 1, $17; No. 2, $16.50; Southern standard car wheel, $20@$21.

Steel Billets and Rods.—The Joliet mills expect to resume next month on rods. Billets are nominally $23.50, and rods $32.50.

Structural Iron and Steel.—Nearly 8 miles of elevated railway construction was contracted for last week, work on which will commence as soon as the frost is out of the ground. Architectural and bridge material are in moderate inquiry. Quotations, car lots, f. o. b. Chicago, are as follows: Angles, $1.90@$2; tees, $2.15@$2.25; universal plates, $1.95@ $2; sheared plates, $1.95@$2; beams and channels, $1.95@$2.25.

Plates.—Demand from mill is fair, but warehouse business is not so good as it was. The boiler makers are agitating another strike for May 1st. Steel sheets, 10 to 14, $2.30@$2.40; iron sheets, 10 to 14, $2.20@$2.30; tank steel, $1.90@$2; shell iron or steel, $2 50@$2.75; firebox steel $4.25@$5.25; flange steel, $2.75@$3; boiler rivets, $4@$4.15; boiler tubes, all sizes, 60%.

Merchant Steel.—There is the ordinary amount of business going which is usually noted at this time of the year, that is, small supplementary orders to piece out contracts are frequent. Orders from railroad shops and mills for tool steel are more active. Quotations are: Tool steel, $6.50@$6.75 and upward; tire steel, $2@$2.10; toe calk, $2.30@$2 40. Bessemer machinery, $2.10@ $2.20. Bessemer bars, $1.70@$1.75; open hearth machinery, $2.30@$2.40; open hearth carriage spring, $2.10@$2.20; crucible spring, $3.75@$4.

Galvanized Sheet Iron.—Manufacturers' agents report mill orders as better than warehouse business. Discounts are easy at 70 and 10% off on Juniata and 70 and 15% off on charcoal, and jobbing quantities at 70 and 5% off on the former and 70 and 10% off on the latter.

Black Sheet Iron.—Demand from all sources is very light and prices a little easier. Quotations on iron sheets are 2·85c. for No 27, common; steel sheets are 2·35c. Jobbers quote 3@3·10c. for iron and 3·10@3·15c. for steel, same gauge.

Bar Iron.—Mill agents state that several of the larger agricultural implement concerns intimate a willingness to make annual contracts, providing prices would be made low enough. General demand is fair, excepting for car iron. Regular and actual quotations on new business are 1·57½@1·60c. base on mill lots. Jobbing price is 1·70@1·75c. for less than car loads of iron or steel.

Steel Rails.—Orders in quantities of 500 tons to 1,000 tons and upward are more frequent, and the local mills look forward to active placement of contracts during March for renewals as well as for extensions. Quotations remain steady at $30@$32 as to quantity and time of delivery. Demand for splice bars in mill lots is active and some large orders are reported. Prices are: 1·60@1·65c. for iron and steel splice bars; track bolts, square nuts, 2·55c.; hexagon, 2·65c; spikes, 2·05@2·10c. according to style.

Nails.—Steel cut nails are in improved demand from mill at $1.40 base Chicago, new card. Jobbers now quote $1.50 in less than carloads. Wire nails are in fair demand from factory at $1.65 Chicago, and $1.70 from jobbers in small lots.

Scrap.—There is quite a fair demand for splice bars and iron axles, other material quiet and offerings large. Railroad, $15.25; No. 1 forge, $15; No. 1 mill, $9.50; fish plates, $16.50; axles, $18.50; horseshoe, $16; pipes and flues, $7; cast borings, $6; wrought turnings, $8; axle turnings, $9.50; machinery castings, $10; stove plates, $6.50; mixed steel, $10.50; coil steel, $15; leaf steel, $16.50; tires, $14.50.

Old Material.—Railroads are offering iron rails more freely for March and April delivery. Transactions are light at $18.50. Old steel rails are quiet at $11.25@$13.50 according to condition and $15 for selected. Car wheels are in better demand at $14.50 @$14.75.

Louisville. Feb. 25.

(Special Report by Hall Brothers & Co.)

Inquiry has been better during the past week, both in number and size of orders, although but few trades of consequence have been reported. Buying is generally light, and efforts to get business bring out very low prices, but buyers insist on still further concessions, which in some cases have met with flat refusals by producers. The immediate outlook is not considered very encouraging, but it does look as though prices are about as low as they can go without seriously affecting the producers.

Hot Blast Foundry Irons.—Southern coke No. 1, $13.50@$13.75; Southern coke No. 2, $12.50@$12.75; Southern coke No. 3, $12@$12.25; Southern charcoal No. 1, $16@$17; Southern charcoal No. 2, $15.50@$16.

Forge Irons.—Neutral coke, $11.50@$12; mottled, $11@$11.25.

Car Wheel and Malleable Irons.—Southern (standard brands), $20@$21; Southern (other brands), $18.50@$19.50; Lake Superior, $19.50@$20.50.

Philadelphia. March 2.

(From our Special Correspondent.)

Pig Iron.—The present activity in several branches of the iron trade will probably soon be reflected in greater activity in pig iron, but so far only the finer brands are well sold up. No fluctuations have occurred except in ordinary forge which sold as low as $12.50, but on the whole trade is in better shape. A great many foundry and forge buyers are about ready to place orders. No. 1 averages $15; No. 2, $14@$14.50, and forge, $13@$13.25; Bessemer pig, $15.75.

Muck Bars.—More inquiry and some trifling business.

Steel Billets.—More buyers are appearing and larger sales are being made af $24 25 to $24 75, but while stocks are low among buyers they don't care to make heavy purchases.

Merchant Iron.—The unsettled condition so often mentioned continues. Prices and business are unsatisfactory. Rates, $1.65, $1.75.

Skelp.—Large orders are at last being placed at $1.50 and much business is promised for April, but not at improved prices.

Sheet Iron.—Manufacturers in their race to secure the largest possible share of the spring and summer trade have continued their policy of shading prices to a point which gives buyers all the advantages.

Wrought Iron Pipe.—While business is quite good prices are demoralized and there seems to be no prospect of improvement. There is no telling where this will end. Considerable business is in sight for April and May.

Plate and Tank.—The rumors of more failures was false. Large orders for shipbuilding purposes have been placed, and mills are now in good enough shape to warrant stronger prices on small orders, but the anxiety for business overcomes wisdom and orders for plates are readily booked at 1·75. It is impossible to get at bottom figures on other kinds, but card rates do not mean much.

Structural Material.—Large orders could be very advantageously placed just now. Prices are shaded on almost all orders. Beams, tees and channel 2@ 2·15; angles, 1·80; universal plates, 1·90. A great deal of business is in sight.

Steel Rails.—A good deal of business is done in small orders, and several large orders are promised within the next 60 days. Price $29.

Old Rails.—Business is some better at $18.50.

Scrap.—Scrap goes as fast as it arrives, and the softer weather is bringing in considerable. Railroad, $16; old fish plates, $22; car wheels, $13@ $13.50.

Pittsburg. March 2.

(From our Special Correspondent.)

Raw Iron and Steel.—The market since our last has been a waiting one, at least to a certain extent; one of the principal drawbacks being a want of confidence that is certainly lacking at present. Buyers of raw material have shown more than usual cautiousness in placing orders. There is, however, a heavy consumption in progress, especially of pig iron, and the sales of crude material, although individually in lots to meet immediate wants, foot up to a considerable amount.

Outside of the leading furnaces it is reported that producers are offering concessions to stimulate buyers to make purchases; but, notwithstanding favorable terms said to be offered, business has not shown up as well as was expected. As there is a possibility that the cost of production will be reduced in the near future, owing to lower prices for ores, consumers in most cases show no disposition to anticipate their future requirements until this factor of the market becomes definitely settled. The fact that the Thomas Iron Company is making contracts with its old customers for iron delivered during the balance of this year at $15, $14 and $13 for the three grades, which are the company's figures announced for business taken during the closing months of last year, indicate that this company anticipates no important change in quotations for some time to come. As yet, however, the company has made no official announcement of its figures for this year's business.

The following are the comparative prices:

Pittsburg.		Philadelphia.	
No. 1 Foundry	$14 00@$14.25	No. 1 Foundry	$14.75@$15.25
No. 2 Foundry	13.00@ 13.25	No. 2 Foundry	14.25@ 14.75
Mill Iron	12.25@ 12.35	Mill Iron	13.00@ 13.25

A fair volume of business is being transacted, but it is not enough to give employment to the available capacity. Any further decline in prices will cause some establishments to shut down, or compel a reduction in wages.

A leading Eastern dealer said concerning the situation: "The market for iron and steel has not gained anything in firmness during the past week. Taken as a whole, and although a great deal of material is changing hands, it seems to have but little influence in prices. A little firmness in one direction is offset by weakness in another, and so it goes from week to week—nothing but a see-saw market. There is naturally some interest felt in regard to the course of events in the near future, but so far as now appears the dead-level of monotony is likely to continue indefinitely. Averaging the market all the way through it is probable that there is little or no change in prices; but the demand is confined largely to the better qualities of pig iron, of which there is only a moderate supply."

Structural Material.—The mills have considerable business on their books, although not equal to the full capacity of the works, and as a consequence every new order is closely competed for.

Steel Rails.—No special movement can be reported. The mills report a fair business at current rates f. o. b. at works, $29.

Coke Smelted Lake and Native Ore.

3,500 Tons	Bessemer, March, April	$13 40 cash.
2,500 Tons	Bessemer, next 2 mos	13.45 cash.
2,000 Tons	Bessemer, April, May	13.50 cash.
2,000 Tons	Bessemer, prompt	13.50 cash.
1,500 Tons	Grey Forge	12.25 cash.
1,000 Tons	Grey Forge	12.25 cash.
1,000 Tons	Bessemer, March	13.40 cash.
1,000 Tons	Bessemer, April, May	13.45 cash.
1,000 Tons	Mill Iron	12.25 cash.
600 Tons	Grey Forge	12.25 cash.
500 Tons	Grey Forge	12.25 cash.
500 Tons	Bessemer	13.40 cash.
500 Tons	No. 1 Foundry	14.00 cash.
450 Tons	No. 2 Foundry	13.00 cash.
250 Tons	No. 1 Foundry	14.00 cash.
150 Tons	off Bessemer	13.00 cash.
100 Tons	No. 1 Silvery	16.25 cash.
100 Tons	No. 2 Silvery	15.25 cash.
50 Tons	No. 3 Foundry	12.75 cash.
50 Tons	No. 1 Foundry	14.25 cash.
50 Tons	No. 2 Foundry	13.25 cash.
50 Tons	Open Mill	12.50 cash.
30 Tons	Open Mill	12.90 cash.
25 Tons	No. 1 Silvery	16.25 cash.

Steel Blooms, Billets and Slabs.

2,000 Tons	Billets and Slabs, March, April	22.15 cash.
2,000 Tons	Billets and Slabs, April	22.10 cash
2,000 Tons	Billets, March	22.25 cash.
1,000 Tons	Billets March, April	22.25 cash.
1,000 Tons	Billets, April	22.30 cash.
750 Tons	Billets, March	22.25 cash.
500 Tons	Billets, at mill	22.00 cash.

Muck Bar.

500 Tons	Neutral	24.25 cash.
500 Tons	Neutral	24.25 cash.
350 Tons	Neutral	24.25 cash

Charcoal.

200 Tons	Cold Blast	26.50 cash.
150 Tons	Cold Blast	24.50 cash.
150 Tons	Cold Blast	25.00 cash.
100 Tons	No. 2 Foundry	19.00 cash.
75 Tons	No. 3 Foundry	19.00 cash.
50 Tons	No. 1 Foundry	20.00 cash.

Iron Skelp.

500 Tons	Sheared Iron, advanced	1.72½ 4 m.
420 Tons	Narrow Grooved	1.50 4 m.
380 Tons	Wide Grooved	1.50 4 m.

Steel Skelp.

500 Tons	Wide Grooved, advanced	1.50 4m.

Steel Wire Rods.

650 Tons	5 gauge American at mill	30.60 cash.

Ferro-Manganese.

200 Tons,	80 per cent domestic	59.25 cash.
75 Tons,	80 per cent. domestic	59.50 cash.

Sheet Bars.

500 Tons	Sheet Bars, at mill	28.00 cash.

Spelter.

200 Tons	Spelter	24.19 cash.

Blooms, Billets and Bar Ends.

500 Tons	Billets and Bar Ends	15.25 cash
200 Tons	Billet Ends	15.00 cash.

Old Iron and Steel Rails.

500 Tons	American T's, Valley Delivery	20.50 cash.
500 Tons	Short Steel Rails	15.50 cash.
500 Tons	American T's Valley	19.75 cash.
150 Tons	American T's Valley	20.00 cash.

Scrap Material.

500 Tons	Cast Scrap, gross	11.50 cash.
400 Tons	Cast Scrap, gross	11.75 cash.
305 Tons	Old Car Wheels, gross	12.50 cash.
300 Tons	Cast Borings, gross	9 00 cash.
250 Tons	Cut Pipe, net	13.06 cash.
150 Tons	Crucible Steel, net	21 00 cash.
150 Tons	No. 1 R. R. W. Scrap, net	14.50 cash.
25 Tons	Hammered Axles, net	25.00 cash.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, March 3d.

PRODUCTION OF BITUMINOUS COAL for week ending February 25th and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

	1893. Week.	1893. Year.	1892. Year.
Phila. & Erie R. R.	4 892	24.020	13,106
Cumberland, Md.	73,814	509,038	505,930
Barclay, Pa.	1,486	13,127	36,364
Broad Top, Pa	15,098	122,583	95,480
Clearfield, Pa.	70,364	617.093	574,013
Allegheny, Pa.	20,936	166.110	183,308
Beach Creek, Pa.	30,673	357,919	373,730
Pocahontas Flat Top	49.31!	384.534	413,568
Kanawha, W. Va.	63,746	493,590	380,016
Total	330,320	2,688,014	2,576,545

WESTERN SHIPMENTS.

	1893. Week.	1893. Year.	1892. Year.
Pittsburg, Pa.	22,626	207,525	216.114
Westmoreland, Pa	34,839	315,306	292,640
Monongahela, Pa	9,246	120,821	73,566
Totals	66,711	643,652	582,320
Grand totals	397,031	3,331,666	3,158,865

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending February 25th, 1893, and year from January 1st, in tons of 2,000 lbs.: Week, 107,454 tons; year 869,061 tons; to corresponding date in 1892, 954,072 tons.

Anthracite.

The interest in the Reading receivership continues to absorb a great deal of public concern. Opinion as to its effect upon the price of coal varies somewhat, but it is generally favorable to a maintenance of circular rates. The meeting of the sales agents on the 28th of February resulted in the usual determination to hold prices up as long as possible. It is not thought that there will be any material change before April or May, although certain forces antagonistic to full circular rates may succeed in reducing the price even of standard grades.

The report of Receivers McLeod, Wilbur and Paxson has not yet been made, and the delay causes some speculation as to the nature of the developments in store. At Buffalo the sheriff seized on the 27th 150,000 tons of coal belonging to the Philadelphia & Reading Railroad Company, but the receivers paid the $27,000 due on the coal and it was released.

A further complication in Reading affairs developed on February 28th in a suit brought by Alfred Sully and A. B. Randall, of New York, and John Lowrie, holding first and second preference income bonds of the Reading to the amount of $797,000, who were granted permission by Judge Dallas to intervene in the pending suit for foreclosure brought by Thomas C. Platt. The complainants want their interest for 1892 and 1893, but refuse to surrender the certificates of the company's prior indebtedness, which is one of the stipulations set forth on the coupons attached to the bonds. The petition, which was presented in the form of a supplemental bill, was referred to George L. Crawford, the master under the receivership proceedings, to take testimony along with the other case.

The payment of the employees is in progress and there seems to be no reason to apprehend a failure on the part of the Reading to let the pay-roll go by default.

The estimated coal shipments of the Reading for the week ending February 25th were 280,000 tons, 6,000 tons going to Port Richmond and 38,000 tons to New York waters.

The following table gives the tonnage of the principal companies for the week ending February 18th, for the year 1893 and the corresponding period in 1892:

	Week.	1893.	1892.	Difference.
Reading R. R.	440,472	4,631,130	4,836,603	Dec. 205,473
Shamokin	22.250	141,860	133,281	Inc. 9,579
Clearfield, Pa.	58,034	392,364	350,685	Inc. 41,679
Hun. & B. Tp.	39,269	206,336	237,321	Dec. 25,985
Norf. & West'rn	55,506	375,972	404,050	Dec. 28,078
Beech Creek	62,354	464,200	379,945	Inc. 84.25
Ches. & Ohio	73,905	2,138,128	1,663,156	Inc. 475,272

The report of the Delaware & Hudson Railroad Co. for 1892 shows that it profited largely by the combination, securing 50% of the increase in the output of anthracite coal. It produced 4,396,852 tons and carried in addition 1,828,442 tons received from other sources, so that it transported 6,225,294 tons during 1892, as against 5,502,813 tons in 1891. It received from coal in 1892 $9,629,334, as against $8,335,010 in 1891.

The Lehigh Coal and Navigation Company reports that during 1892 it produced 1,203,662 tons, the greatest output in any year in its history; the cost of production was $1.47 per ton.

The commission on the anthracite coal waste, of which the Hon. Eckley B. Coxe is chairman, hopes to finish its report this spring. It will enter very fully into the matter and should be a most valuable contribution to economic science. The present methods of mining and preparing anthracite coal are a disgrace to the century, and the sooner we realize this and act upon it the better off we will be. Millions of tons are lost every year through incompetency, ignorance and carelessness. Anthracite coal mining is to-day saddled with greater and more

pressing obstacles to profitable work than almost any other industry of the country.

The output in the third anthracite district last year was 3,066,092 tons.

Prices here are as follows, quoted by Philadelphia & Reading at loading ports:

	Broken.	Egg.	Stove.	Chestnut.
Hard White Ash.....	$4.10	$4.50	$4.75	$4.65
Free " "	4.00	4.40	4.75	4.65
Shamokin.....	....	4.60	4.95	4.65
Schuylkill.....	....	4.65	5.10	4.90
Lorberry.....	....	4.65	5.10	4.90
Lykens Valley.....	5.10	5.65	6.15	5.25

The average of anthracite coal prices in Schuylkill County in February was $2.64, as against $2.646 in January, $2.23 in February last year, and $2.31½ in February, 1891.

Bituminous.

The market is quiet. Nothing of any special importance has transpired since last report, and the trade jogs along at a comfortable gait.

There has been so much trouble this winter on account of the scarcity of cars that the Pennsylvania Railroad Company has given an order for 2,000 coal cars for the Pittsburg district.

The combination in the Hocking Valley is practically effected, but it remains to be seen how it will fit in with the economic conditions in Ohio. The Norfolk & Western, as well as the Chesapeake & Ohio, can get into Ohio quite as easily as to Norfolk or Newport News, and it would be well for the Hocking combine to appreciate this element of possible rivalry.

The usual amount of speculation as to the purposes of the Dominion Coal Company is to be heard in certain quarters. This is the American syndicate that recently secured control of the Cape Breton coal mines, and the officers are: President, H. M. Whitney, Boston; Treasurer, John S. McLennan, Montreal; chief engineer, F. S. Pearson, Boston; resident manager, D. McKeen, Glace Bay, Cape Breton.

Certain estimates are given as to the cost of delivering the Cape Breton coal on vessels at Louisburg, and $1 is taken as the basis. The company seems to be proceeding on the assumption that the duty of 75 cents per ton will be taken off, so that this coal can be laid down at Boston for $1.75 or $2 per ton. Without expressing any opinion as to the removal of the duty we venture to say that the Cape Breton coal may be laid down at Boston for $2 a ton, but that this rate will not be made.

There are several considerations that affect the successful rivalry of the Dominion Coal Company with American companies. In the first place there is the present duty of 75 cents per ton, which, we beg our friends to notice, has not yet been removed or reduced. If it remains at 75 cents, the opportunity for capturing the New England trade will be slim enough; if it is taken off, there will still remain the great obstacle of inferior quality to overcome. While there will always be a considerable number of people who will buy coal just because it is cheap, the trade best worth having is more particular.

A cargo of Cape Breton coal will not compare with a cargo of George's Creek or any other good Cumberland coal as to quality, and while it may be delivered at Boston for 50 cents or $1 a ton less, it will not be able to run its rival clear off the field or secure the best of the market.

Charter rates are: Philadelphia to Sound ports-$1.05; to Boston, $1.15; Baltimore, Norfolk and Newport News rates, 10 cents higher; New York to Boston, 75 to 85 cents.

Boston. March 2.

(From our Special Correspondent.)

The trade can feel secure, at least for the next fortnight, as the sales agents have decreed that prices remain unchanged until their next meeting. Buying is fair, but the trade is taking no more than it actually needs, awaiting the coming of spring. Freight rates continue high, which, of course, makes prices firm. Dealers' stocks are light, as trade has been heavier than expected. The retail coal dealers now realize what a faux pas they made last week when they reduced prices 50 cents per ton. As it was they made good profits at the 50-cent reduction, although there was so much snow on the ground; carting was bad and more expensive than usual.

Prices quoted here are net circular New York: Stove, $4 75; egg, $4.40; free broken, $4.00; chestnut, $4.65; Lykens Valley (at Philadelphia), broken, $4.85; egg, $5 45; stove, $6.00; chestnut, $5.00.

The demand for bituminous coal is very good. Stocks are light, and receipts, though larger than they were, do not show up very large as yet. The loss of such a large number of vessels during the recent storm is having a very strengthening effect on the market. One of the latest and most important losses so far as this market is concerned was that of the "Agnes Manning," with a cargo of 1,560 tons Cumberland coal consigned to David Sturtevant, of this port. She foundered at sea, 300 miles southeast of Boston.

At present dealers are quoting $4.00 on George's Creek coal on cars here, and $3 85 on Clearfield, but both would bring 50c. per ton more spot.

Freight rates are firm, especially from New York, where there is a scarcity of tonnage. Rates are: From New York, 85c.@$1; from Philadelphia, $1.40 @$1.50; from Baltimore, $1.25@$1.35; from Newport News and Norfolk, $1.15@$1.25.

Retailers are busy and are maintaining their new schedule of prices. Quotations here are: Stove, $6.50; nut, $6.50; egg, $6.25; furnace, $6.00; Franklin, $7.75; Lehigh egg, $6.50; Lehigh furnace, $6.25; soft coal, $4.25@$5.00. Wharf prices from 75c. to $1 per ton less.

The receipts of coal at the port of Boston for the week ending February 25th were 24,608 tons of anthracite and 35,162 tons of bituminous, against 4,121 tons of anthracite and 2,650 tons of bituminous for the corresponding week last year. Since January 1st the receipts have been 158,008 tons of anthracite and 133,514 tons of bituminous, against 199,479 tons of anthracite and 79,399 tons of bituminous for the corresponding time last year. Receipts from the provinces thus far this year have been 2,980 tons bituminous.

Buffalo. March 2.

(From our Special Correspondent.)

The anthracite coal trade continues active. Many orders from near-by villages and towns have been filled lately in consequence of the severe weather, causing a rapid depletion of stocks of fuel. Prices without change and no variation expected until the first or third week in April.

Bituminous coal in good demand for local manufacturers and the unchanged quotations have ruled firm. Supply about adequate for the daily requirements of the trade, so that cars are readily unloaded on arrival without demurrages or delay.

On February 25th Sheriff Beck took possession of the Philadelphia & Reading Coal and Iron Company's stock of 150,000 tons of coal at East Buffalo on a claim for $27,000, alleged to be due the Brown Conveying and Hoisting Company, of Cleveland, for constructing the coal trestles at Checktowaga of the Lehigh and Reading companies. Last Tuesday an amicable settlement was effected by the Reading receivers, and the $27,000 paid. All's well that ends well. Next season's business on the lakes promises to be large and remunerative. The coal capacity of the vessels in port at Buffalo is about 127,000 net tons.

The generally expressed opinions of our coal men with regard to prices of anthracite fuel inconsequence of the Reading assignment may be summarized in a few words: Coal will remain at present prices; Reading will not flood the markets to raise money; consumption so large this winter that all points of storage for distribution will be practically bare of stocks in the spring, and rail transportation facilities may not be adequate during the World's Fair to move a large tonnage of coal.

Eighteen Poles, men and women, were arrested on Saturday for stealing coal from the New York Central Railroad yards, the result of a raid by the police.

Chicago. March. 2.

(From Our Special Correspondent.)

Trade here continues good. The air has been full of rumors of the consequences which were to arise from the apparent downfall of the combination, but it still pursues the even tenor of its way. Stocks are being rapidly reduced and the opening of navigation will find this market in the best shape it has been for years to meet the lower price which is already being discussed to take effect as soon as shipments can be made. Everything points to a large trade in the earlier months this year, and unless there should be a materialization of some of the rumors of a disruption of the combine, it is safe to predict that 1893 will be the banner year of the anthracite trade.

There has been some falling off in the output of coal in this market during January and February. Conservative estimates make the daily output of the various interests here at an average of about 7,000 tons per day, which has now probably fallen to about 5,000 tons per day. On the estimate of about 258,000 tons in stock February 13th this would show a reduction in stocks on hand to about 155,000 or 160,000 tons. This, with two months to provide for, will clearly indicate the remarkably good condition of the market. Especially is this so when it is remembered that for many years past the month of March has been the best month of the entire year for trade for retailers, and this year, with its long continuation of cold weather, should certainly not prove any exception to the rule, as stocks in consumers' hands must naturally be at a very low ebb. On account of the milder weather all rail coal is coming forward in better shape, and while there is, of course, for the same reason some little falling off in country orders there is more than enough business to prevent any accumulation of coal on track.

On all sides and from all directions come the same reports of the difficulties of securing enough coal to fill satisfactorily all orders for bituminous coal. Day after day shippers have received but half enough coal to meet their daily requirements, and only by helping each other have they been enabled to prevent serious consequences to their customers. Railroads have been compelled to issue the most arbitrary orders in regard to not allowing their cars to run beyond Chicago. As a consequence the country trade has suffered severely and been obliged to take any kind of coal from any source from which they could procure it. Should there be any spread to the other railroads of the "recent unpleasantness" on the Belt Line and Western Indiana, by a strike among switchmen, the situation would be exceedingly bad, considering the present hand to mouth supplies coming into this market. The increase in the demand for soft coal during the past six months has been simply incredible, and every shipper and dealer having fair facilities for bituminous coal reports an increase in orders of from 60 to 100 per cent. Indiana block coal is selling freely on a basis of $1.75 per ton at mine with only a limited quantity obtainable daily. This is but one item on soft coal, with all the other grades above and below it in quality bringing relatively as good prices. The mine owners in the northern Illinois coal districts report well-filled order books at full circular, and there will be no change in price in March. Operators in the central part of this State have been much annoyed by shortage in the supply, but are now in better shape. Hocking coal has been short at this point on account of the accumulation of freight on trunk lines east of here, and several of them last week issued peremptory orders to refuse all coal offered by Ohio roads until they could get it moved.

Coke of Connellsville make is in short supply, and will be more so this and next week on account of the Inauguration ceremonies. The passenger traffic will prevent the rapid movement of freight. Demand is good for all kinds just now at full quotations.

Quotations are: $4.65 furnace; $5.05 foundry, crushed; $5.40 Connellsville; West Virginia: $3.90, furnace, $4.10 foundry; New River foundry, $4.75; Walston: $4.65 furnace, $5 foundry.

Circular prices are at the following rates: Lehigh lump, $6.50; large egg, $5.85; small egg, range and chestnut, $6.10. Retail prices per ton are: Large egg, $7.25; small egg, range and chestnut, $7.25.

Prices of bituminous per ton of 2,000 lbs., f. o. b. Chicago, are: Pittsburg, $3.40; Hocking Valley, $3 10; Youghiogheny, $3.25; Illinois block, $2; Brazil block, $2.60@$2.75.

Pittsburg. March. 2.

(From our Special Correspondent.)

Coal.—The situation at the present time is very difficult to describe; no two persons describe matters alike. Reports one day are generally discredited the next; under the circumstances we do the best we can. There is no coal loaded and, of course, there was no shipment. The spring trade has been ruined beyond all doubt. The steamer "Rescue," owned by Charles Sutte & Co., left for the Kanawha with empties to be loaded with coal for Cincinnati. The number of miners at work in the second and third pools are less than 150 men. H. D. O'Neil & Co., of Elizabeth, intend putting in two coal cutting machines at their mines. Each will have a capacity of 4,000 bushels a day, thus doing the work of 40 men. Machines are in successful operation in some of the Panhandle mines.

The P., S. & L. E. Railroad Company have just closed a large contract with the Grand Trunk Railroad Company to furnish them with 200,000 tons of coal. It will require a very large train for 312 days to carry this coal to its destination. This same company has already filled some very large contracts of the same kind.

Coal men in Cincinnati are becoming very much alarmed over the Pittsburg coal outlook. From reliable information at hand they do not believe the coal troubles at Pittsburg will be adjusted this summer, and as a consequence this market will be at the mercy of the Kanawha mines.

Connellsville Coke.—A marked improvement was perceptible in the car supply, which has been a source of annoyance to the operators and a consequent loss in having to stock the product of their ovens in the yards or suspend operations. About 360 ovens were blown out, and in consequence the production decreased about 3,400 tons. For the current week a more hopeful feeling prevails. Though ovens are being blown out, there is nothing like a despondent feeling among the operators. They deem it a better policy to keep just enough ovens in blast to supply the demand than to keep most of the ovens in blast and run four days a week or stock the over-production of coke. Nearly all the works got a six days' run. Ovens in blast, 12,830: idle, 4,499, with an estimated production of 123,354 tons; a decrease of 3,386 tons compared with the previous week. The shipments for the week aggregated 7,563 cars, consigned as follows: To Pittsburg and river tipples, 1,765 cars; points west of Pittsburg, 3,649 cars; points east of Connellsville, 2,149 cars. Compared with the preceding week's shipment shows an increase of 279 cars. Prices nominal, unchanged.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, March 3.

Heavy Chemicals.—There is very little change to report of this market. The position of the various articles continues as reported last week. There is some scarcity of goods on the spot and prices are firm. We quote: Caustic soda, 60%, 2·95@3·10c.; 70%, 2·70@2·80c.; 74%, 2·72½@2·82½c.; 76%, 2·80@2·90c. Carbonated soda ash, 48%, 1·40@1·60c.; 58%, 1·35@1·40c. Alkali, 48%, 1·35@1·40c.; 58%, 1·20@1·30c., according to package. Sal soda, English, on the spot, 1·05@1·10c.; American, 90@95c.; bleaching powder, 2·37½@2·62½c.

Acids.—The demand for the various acids continues good, both for immediate and for future delivery. Manufacturers, without exception, report a good business. Prices show no change of importance and we quote: Acid, per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, $1.75@$2.25, according to quality; muriatic, 18° 90c.@$1.10; 20°, $1@$1.25; 22°, $1.25@$1.50; nitric 40°, $4; 42°, $4.50@$4.75; sulphuric, 90c.@$1.10'

mixed acids, according to mixture; oxalic, $6.15@$6.50. Blue vitriol is quoted all the way from $3.25 to $3.75; glycerine for nitro-glycerine, 11½@12½ according to quality and quantity.

Brimstone.—This market continues very quiet and devoid of features of interest. Prices have advanced slightly, and we quote: Best unmixed seconds, on the spot, $21; to arrive, April-May shipments, $20.25; best unmixed thirds, on the spot, $20; April-May shipments, $19.25.

Fertilizing Chemicals.—This market continues active and many sales are reported. The demand is good, especially from the South, and owing to this and the continued scarcity of ammoniates prices are higher than last week. Our quotations are as follows: Sulphate of ammonia, on the spot $3.05@$3.15 for bone goods and $3.20 @$3.30 for gas liquor. Dried blood, $3.10@$3.12½ per unit for high grade and $3.05 for low grade; acidulated fish scrap, no stocks on hand; dried scrap is scarce and is quoted at $31 f. o. b. fish factory. Azotine, $3.05 @$3.10. Tankage, high grade, $31@$33; low grade, $29@$31. Bone tankage, $24@$25; bone meal, $23.50@$25.50.

Phosphate Rock—There is nothing of interest to report of the phosphate market this week. Quotations are unchanged: $4.75 for 55% rock, free alongside at Charleston. Messrs. Couper, Millar & Co., of London, Eng., send us the following report on the fertilizer market of the United Kingdom: There is scarcely any difference to report in the European fertilizer market since our last issue. Prices of all phosphates remain depressed, owing to the abnormally cheap trans-Atlantic freights. The outlook for the consumption of fertilizers seems promising, and the demand will probably exceed that of last year. The shipments of phosphates last year to the United Kingdom from all sources were considerably in excess of those of the previous year; and the imports into France also show an increase, while the exports of French phosphates show a great diminution.

Mineral Phosphates.—Canadian Phosphate: Our latest advices from Canada show that this year's production will be very small, and no sales are as yet reported. South Carolina quoted at 6½d. per unit; Florida Hard Rock 75% firm at 8@8¾d. per unit. River Pebble 60 to 65% steady at 7d., and Land Pebble 70% held for 7¼d. Ground Somme 10d. for 70% and nominally 11d. for 75%, basis c. i. f. London, the latter grade being very scarce. Ground Belgian unchanged at about 5d. per unit, f. o. b. Osso we hear of nothing doing. Cambridge and Bedford coprolites, there is a slight demand for.

The price of double manure salts as fixed by the syndicate is as follows: New York and Boston, $1.12; Philadelphia, $1.14½; Charleston and Savannah, $1.17 cwt. basis, 48@50% in 50 ton lots on foreign weights and analyses. Sulphate of potash, 90%-96%, basis, 90%: New York and Boston, $2.07; Philadelphia, $2.09¼; Charleston and Savannah, $2.12; sulphate of potash, 96-99%, basis 90%, is 4% higher.

Muriate of Potash.—During the week, arrivals of muriate aggregated 350 tons. Sales of 150 tons, both spot and to arrive, are reported. Prices for 1893 are as follows: New York or Boston $1.78; Philadelphia, $1.80½; Southern ports, $1.83.

Kainit.—This market is very quiet. Quotations for shipments previous to September are as follows: New York, Philadelphia and Boston, $8.75 for foreign invoice weight and test, and $9 for actual weight; Charleston, Savannah and Wilmington, $9.50 for invoice weight and test, and $9.75 for actual weight. Shipments after September 1st, 25c. higher.

Nitrate of Soda.—There has been a fair demand for nitrate of soda during the week and a good volume of business has been done. Prices are as follows: On the spot, $2.40@$2.45. To arrive, near by, $2.25. April, May, June, July shipments, $1.71½.

Messrs. Mortimer & Wisner, the well known brokers, send us the following interesting statistics of nitrate of soda issued under date of March 1st:

	1893.	1892.	1891.
	Bags.	Bags.	Bags.
Imported into Atlantic ports from West Coast S. A. from Jan. 1, 1893, to date	58,465	66,404	93,130
Imported into Atlantic ports from Europe	5,225	.....	.....
	63,690	66,404	93,130
Stock in store and afloat March 1, 1893, in New York	1,406	40,968	47,554
Boston	.....	500	.....
Philadelphia	.....	.....	.....
Baltimore	2,000	....	3,000
To arrive, actually sailed	279,500	270,000	182,000
Visible supply to June 1, 1893	282,906	311,468	232,554
Additional charters	169,000	169,000	267,000
Total supply, when shipped	451,906	480,468	499,554
Stock on hand, Jan. 1, 1893	15,454	53,585	36,454
Deliveries past month	41,644	22 654	66,828
Deliveries since Jan. 1 to date	75,738	78,521	79,030
Total yearly deliveries	.. ....	685,158	634,207
Prices current March 1, 1893	2½@2.3c	1.82c	2·10c

Liverpool. Feb. 22.

(Special Correspondence of Joseph P. Brunner & Co.)

Although our market is not active, there is a fair demand for heavy chemicals generally.

Soda Ash.—There is a fair inquiry, but most of the business has been done on private terms, and it is difficult to give any reliable quotations. The nearest range is about as follows: Caustic Ash, 48%, £5 to £5 5s. per ton; 57 to 58%, £5 15s. per ton. Carb. Ash, 48%, £5 to £5 5s. per ton; 58%, £5 7s. 6d. to £5 15s. per ton. Ammonia Ash, 58%, £5 to £5 5s. per ton, all net cash. For contracts over all 1893, concessions would probably be made. Soda Crystals, dull; £3 2s. 6d. to £3 3s. 9d. per ton, less 5%.

Caustic Soda receives little attention, and the quotations are still very irregular, depending entirely upon quantity and export market. The nominal values range as follows: 60%, £8 5s. to £9 per ton; 70%, £9 5s. to £10 per ton; 74%, £10 5s. to £11 per ton; 76%, £11 15s. to £12 5s. per ton—all net cash. For parcels under 10 tons 5% per ton extra is charged. For contracts over all 1893, makers are prepared to meet buyers.

Bleaching Powder is strong at £8 10s. to £8 15s. per ton, net cash, for hardwood packages, and it is anticipated that prices will be further advanced shortly.

Chlorate of Potash.—The excitement of last week has toned down, and during the last day or two the market has been rather quiet, but at the same time this article is scarce for any position. For prompt delivery 9½d. per lb. is nearest value, and even higher prices asked. We quote: March, 8¾d. to 9d.; April and May, 8¾d.; June, 8½d.; July to Dec., 7¾d. to 8d. per lb.

Bicarb. Soda is selling at £6 15s. per ton, less 2½% for one cwt. kegs, with usual allowances for larger packages.

Sulphate of Ammonia has been in good request, and it is now difficult to pick up anything for prompt delivery, and prices have advanced. The nearest spot values to-day are £11 per ton for good grey, 24%, and £11 2s. 6d. per ton for 25%, both in double bags, f. o. b. here, less 2½%, but difficult to find any sellers.

Nitrate of Soda.—This article continues to advance steadily and to-day £10 5s. to £10 7s. 6d. per ton, less 2½%, are nearest quotations for double bags f. o. b. here.

Carb. Ammonia.—Lump, 2⅞d. per lb.; powder, 3⅛d. to 3¼d. per lb.

CURRENT PRICES.

These quotations are for wholesale lots in New York unless otherwise specified.

Acid—Acetic, chem. pure .16@.17
Commercial, in bbls. and cbys. .015@.017
Carbonic, liquefied, ℔ lb. .18@.25
Chromic, chem. pure, ℔ lb. 1.00
for batteries .40
Hydrobromic, dilute, U. S. P. .25
Hydrocyanic, U. S. P. .45
Hydrofluoric .20
Alcohol—95%, ℔ gall. $2.30@$2.40
Absolute $3.80
Ammoniated $2.80
Alum—Lump, ℔ cwt. $1.75@$1.80
Ground, ℔ cwt. $1.85@$1.90
Powdered, ℔ lb. .04½@.05
Lump ℔ ton, Liverpool £5
Aluminum Chloride—Pure, ℔ lb. $1.25
Amalgamating solution, ℔ lb. .60
Sulphate, ℔ cwt. $1.90@$2.50
Ammonia—Sul., in bbl. lots, ℔ lb. 02½@.03
Carbonate, ℔ lb., English and German, .07½@.07¾
Muriate, white, in bbls., ℔ lb. .08½
Aqua Ammonia—(in cbys) 18° ℔ lb. .03@.04
20°, ℔ lb. .04@.05
26°, ℔ lb. .05@.05½
Antimony—Oxymur, ℔ lb. .04@.06
Regulus, ℔ lb. .10@.11½
Argols—Red, powdered, ℔ lb. .15
Arsenic—White, powdered ℔ lb. .03@.03½
Red ℔ lb. .065@.07
Yellow .08@.09
White at Plymouth, ℔ ton £12 2 6
Asbestos—Canadian, ℔ ton $50@$300
Italian, ℔ ton, c. i. f. L'pool £18@£60
Ashes—Pot, 1st sorts, ℔ lb. 4.75@5
Pearl .06@.06¾
Asphaltum—
Prime Cuban, ℔ lb. .04@.05
Hard Cuban, ℔ ton $28.00@$30.00
Trinidad, refined, ℔ ton $30.00@$35.00
Egyptian and Syrian, ℔ lb. .05@.07½
Californian, at mine, ℔ ton $12.00@$26.00
at San Francisco, ℔ ton $15.00@$29.00
Barium—Carbonate, pure, ℔ lb. .45
Carbonate, commercial, ℔ lb. .05@.10
Chlorate, crystal, ℔ lb. .75
Chloride, commercial, ℔ lb. .05@.10
pure, ℔ lb. .16
Iodide, ℔ oz. .40
Nitrate, ℔ lb. .06¾@.07½
Sulph., Am. prime white, ℔ ton $17.50@$19
Sulph., foreign, floated, ℔ ton $21@$23
Sulph., off color, ℔ ton $11.50@$14.00
Carb., lump, f. o. b. L'pool, ℔ ton £6
No. 1, Casks, Runcorn, " " £4 10 0
No. 2, bags, Runcorn, " " £3 15 0
Bauxite—℔ ton $10.00
Bichromate of Potash—Scotch, ℔ lb. .11@.12
American, ℔ lb. .11@.12
Bichromate of Soda—℔ lb. .09½@.10
Borax—Refined, ℔ lb., in car lots .08@.09
San Francisco .08@.08½
Concentrated, in car lots .07½@.08
Refined, Liverpool ℔ ton £2
Bromine—℔ lb. .15@0.2
Cadmium Minion—℔ lb. $2.00
Cadmium Iodide—℔ lb. $5.50
Chalk—℔ ton $1.40@$1.75
Precipitated, ℔ lb. .05@.06
China Clay—English, ℔ ton $13@$18.00
Domestic, ℔ ton $9@$11
Chlorine Water—℔ lb. .10
Chrome Yellow—℔ lb. .10@.25
Chrome Iron Ore—℔ ton, San Francisco $10.00
Chromalum—Pure, ℔ lb. .40
Commercial, ℔ lb. .12
Cobalt—Oxide, ℔ lb. $1.90@$2.00
Copper—Sulph. English Wks. ton £20@£21
Vitriol (blue), ordinary, ℔ lb. 03¾@.0[illegible]
" extra .04½
Nitrate, ℔ lb. .40
Copperas—Common, ℔ 100 lbs. .90@$1.00
Best, ℔ 100 lbs. $1.35@$1.50
Liverpool, ℔ ton, in casks £2@£2 10s.
Corundum—Powdered, ℔ lb. .04½@.09
Flour, ℔ lb. .03
Cryolite—Powdered, ℔ lb., bbl. lots .07
Emery—Grain, ℔ lb. (℔ kg.) .04½@.05
Flour, ℔ lb. .02½@.10
Epsom Salt—℔ lb. .01@.01½
Feldspar—Ground, ℔ ton $6.00@$10.00
Crude $2.00@$3 00
Fluorspar—Powdrd, No. 1, ℔ ton $20@$30
Lump, at mine $6@$8
French Chalk—
Fuller's Earth—Lump, ℔ ton. £16@£22
Glauber's Salt—in bbls., ℔ lb. .01@.01¼
Glass—Ground, ℔ lb. .10
Gold—Chloride, pure, crystals, ℔ oz. $1 .00
pure, 15 gr., c. v., ℔ doz. $5.40
liquid, 15 gr., g. a. v., ℔ doz. $5.50
Chloride and sodium, ℔ oz. $6.00
15 gr., c. v., ℔ doz. $2.88
Oxide, ℔ oz. $27.25
Gypsum—Calcined, ℔ bbl. $1.25@$1.50
Land Plaster
Iodine—Resublimed $3.30@$3 35
Iridium—Oxide ℔ lb. $90
Iron—Nitrate, 40°, ℔ lb. .01@.01½
47°, ℔ lb. .02@.02½
Kaolin—*See China Clay.*
Kieserite—℔ ton $9@$10
Lead—Red, American, ℔ lb. .06¾@.07½
White, American, in oil, ℔ lb. .06½@.07½
White, English, ℔ lb., in oil .08½@.08¾
Acetate, or sugar of, white .06@.06½
Granulated
Nitrate .09@.10
Lime Acetate—Am. Brown .90@.95
" Gray $1.75@$1.87½
Litharge—Powdered, ℔ lb. .06¾@.07½
English flake, ℔ lb. .09@.09½
Magnesite—Crude, ℔ ton of 1,015 kilos $14.75
Calcined, ℔ ton of 2,240 lbs. $22.00
Brick, ℔ ton of 2,240 lbs. $47.50
Manganese—Ore, per unit .23@.28
Oxide, ground, ℔ lb. .02½@.06½
Mercuric Chloride—(*Corrosive Sublimate*) ℔ lb. .62@.64
Powdered, ℔ lb. .60
Marble Dust—℔ bbl. $1.25
Metallic Paint—Brown ℔ ton $20@$25
Red $20@$25
Mineral Wool—Ordinary slag .01½
Ordinary rock .02½
Ground, ℔ ton
Mica—In sheets according to size.
1st quality, ℔ lb. .25@$6.00
Naphtha—Black
Nitre Cake—℔ ton $10.00
Ochre—Rochelle, ℔ lb. $1.10@$1.50
Washed Nat Oxf'rd, Lump, ℔ lb. 06¾@.06¾
Washed Nat Oxf'rd, Powder, ℔ lb. .07@.07½
Golden, ℔ lb. .03@.05
Domestic, ℔ ton $12@$20
Oils, Mineral—
Cylinder, light filtered, ℔ gal. .14@.16
Dark filtered, ℔ gal. .10@.13
Extra cold test, ℔ gal. .20@.24
Dark steam refined, ℔ gal. .09@.12
Phosphorus—℔ lb. .50@.55
Precip., red, ℔ lb. .82@.85
white, ℔ lb. .85@.90
Platinic Chloride—℔ oz. $7
Plumbago—Ceylon, ℔ lb. .04@.06
American, ℔ lb. .05@.07
Potassium—Cyanide, ℔ lb., C. P. 67%, ℔ lb. .70
fused .45
Bromide, domestic, ℔ lb. .40
Chlorate, English, ℔ lb. .25@.28
Chlorate, powdered, English, ℔ lb. .14@.15½
Carbonate, ℔ lb., by casks, 82% .04½@.05
Caustic, ℔ lb., pure slick .06@.06½
Iodide, ℔ lb. $2.58@$2.80
Nitrate, refined, ℔ lb. .06@.08
Bichromate, ℔ lb. .10@.11½
Yellow Prussiate, ℔ lb. .23
Red Prussiate, ℔ lb. .42@.45
Pumice Stone—Select lumps, lb 03½@.15
Original cks., ℔ lb. .01¼@.02
Powdered, pure, ℔ lb. .01¼@.01¾
Pyrites—Non-cupreous, p. units .12@.15
Quartz—Ground, ℔ ton $6.00@$10.00
Rotten Stone, Powdered, ℔ lb. 03¼@.03½
Lump, ℔ lb. .06@.07
Original cks, ℔ lb. .04½@.05½
Rubbing stone, ℔ lb. .03½@.04
Sal Ammoniac—lump, in bbls., ℔ lb. 80½
Salt—Liverpool, ground, ℔ sack .70
Domestic, fine, ℔ ton $7@$7.5
Common, fine, ℔ ton $4.50@$5
Turk's Island, ℔ bush .26@.28
Salt Cake—℔ ton $10.0[illegible]@$15.00
Saltpeter—Crude, ℔ lb. .03¼@.04
Soapstone—Ground, ℔ ton $6@$
Block and slab according to size.
Sodium—Prussiate, ℔ lb. .22@.24
Phosphate, ℔ lb. .04@.05
Stannate, ℔ lb. .06@.12
Tungstate, ℔ lb.
Hyposulphite, ℔ lb., in casks .0235@.0245
Strontium—Nitrate, ℔ lb. .08¾@.09
Sulphur—Roll, ℔ lb. .02½
Flour, ℔ lb. .02¾
Sylvinit, 27@36%, S.O.P., per unit .40
Talc—Ground French, ℔ lb. .01¼@.01½
American No. 1, ℔ lb. .01¼@.01½
American No. 2 006
Terra Alba—French, ℔ lb. .65@.80
English, ℔ lb. .65@.80
American, No. 1, ℔ lb. .60@.70
American, No. 2, ℔ lb. .45@.56
Tin—Crystals, in kegs or bbls. .14@.10
feathered or flossed. .20
Muriate, single .07@.06
Double or strong, 54° B. .10@.15
Oxymur, or nitro .19
Vermilion—Imp. English, ℔ lb. .85@.90
Am. quicksilver, bulk .57 @.6[illegible]
Am. quicksilver, bags .58 @ .6[illegible]
Chinese .85 @$1.00
Trieste .90 @ .95
American .11½@ .12
Zinc White—Am., Dry, ℔ lb. .04½@ .05
Antwerp, Red Seal, ℔ lb. .06¾@.07
Paris, Red Seal, ℔ lb. .07¾@.08
Muriate solution .06
Sulphate crystals, in bbls., ℔ lb. .03¾

THE RARER METALS.

Aluminum—℔ lb. .50@.65
Arsenic—(Metallic), per lb. .40
Barium—(Metallic), per gram $4.00
Bismuth—(Metallic), per lb. $2.25
Cadmium—(Metallic), per lb. $1.00
Calcium—(Metallic), per gram $10.00
Cerium—(Metallic), per gram $7.50
Chromium—(Metallic), per gram $1.00
Cobalt—(Metallic), per lb. $6.00
Didymium—(Metallic), per gram $9.00
Erbium—(Metallic), per gram $7.50
Gallium—(Metallic), per gram $140.00
Glucinum—(Metallic), per gram $12.00
Indium—(Metallic), per gram $9.00
Iridium—(Fused), per oz. $12.00
Lanthanum—(Metallic), per gr. $10.00
Lithium—(Metallic), per gram $10.00
Magnesium—(Powdered), per lb. $4.00
Manganese—(Metallic), per lb. $1.10
Chem. pure, per oz. $10.00
Molybdenum—(Metallic), per gm .50
Niobium—(Metallic), per gram $5.00
Osmium—(Metallic), per oz. $65.00
Palladium—(Metallic), per oz. $35.00
Platinum—(Plate), per oz. $9.75
Potassium—(Metallic), per lb. $28.00
Rhodium—(Metallic), per gram $5.00
Ruthenium—(Metallic), per gm. $5.50
Rubidium—(Metallic), per gram $2.00
Selenium—(Metallic), per oz. $1.80
Sodium—(Metallic), per lb. 50@.75
Strontium—(Metallic), per gm. .60
Tantalium—(Metallic), per gram $9.00
Telurium—(Metallic), per lb. $5.00
Thallium—(Metallic), per gram .20
Titanium—(Metallic), per gram $2.20
Thorium—(Metallic), per gram $17.00
Tungsten—(Metallic), per lb. .80
Uranium—(Oxide), per lb. $5.00
Metallic, per gm. .20
Vanadium—(Metallic), per gm $22.00
Yttrium—(Metallic), per gram $9.00
Zirconium—(Metallic), per oz $65.00

NEW YORK MINING STOCK QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Feb. 25		Feb. 27.		Feb. 28.		Mar. 1.		Mar. 2.		Mar 3.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams, Colo.													
Alice, Mont.	.50												100
Amador, Cal.													
Atlantic, Mich.													
Belcher, Nev.													
Belle Isle, Nev.													
Bodie Cons., Cal.	.20												100
Bos. & Mont., Mont													
Breece, Colo.													
Bulwer, Cal.	.15												200
Caledonia, S. Dak.													
Catalpa, Colo.													
Chrysolite, Colo.							.22						500
Colorado Central, Colo.													
Commonwealth, Nev.													
Comstock T. bonds, Nev.													
" scrip., Nev.													
Cons. Cal. & Va., Nev.	2.90												100
Crown Point, Nev.													
Deadwood, Dak.													
Enterprise.													
Eureka, Cons., Nev.													
Father de Smet, Dak.													
Freeland, Colo.													
Gould & Curry, Nev.	.95												100
Grand Prize, Nev.													
Hale & Norcross, Nev.	1.30						1.25						200
Homestake, Dak.													
Horn-Silver, Utah.													
Independence, Nev.													
Iron Hill, Dak.													
Iron Silver, Colo.													
Leadville Cons., Colo.	.10												500
Little Chief, Colo.													
Martin White, Nev.													
Mono.													
Mt. Diablo, Nev.													
Navajo, Nev.													
N. Belle Isle, Nev.													
Ontario, Utah.													
Ophir, Nev.	2.35						2.10						200
Overman, Nev.													
Plymouth, Cal.													
Quicksilver, Pref., Cal.									3.00				500
" Com., Cal.													
Quincy, Mich.													
Robinson Cons., Colo.													
Savage, Nev.	1.00												100
Sierra Nevada, Nev.													
Silver Cord, Colo.													
Silver King, Ariz.													
Silver Min. of L. Valley													
Small Hopes, Colo.													
Standard Cons., Cal.			1.40										100
Yello v Jacket, Nev.							.65	.60					200

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Feb. 25.		Feb. 27.		Feb. 28.		Mar. 1.		Mar. 2.		Mar. 3.		SALES
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alpha., Nev.													
Alta, Nev.													
American Flag, Colo.													
Andes, Cal.													
Astoria, Cal.													
Augusta, Ga.													
" bonds.													
Barcelona, Nev.													
Belmont, Cal.													
Best & Belcher, Nev.							1.70	1.65					150
Bonanza King, Cal.													
Brunswick, Cal.			.07		.07						.07		1,300
Bullion, Nev.													
Butte & Bost., Mont.													
Castle Creek, Idaho.													
Chollar.	.65												200
Comstock T., Nev.	.13	.12							.11		.13		2,200
Con. Imperial, Nev.													
Con. Pacific, Cal.													
Crescent, Colo.													
Del Monte, Nev.													
El Cristo, Rep. of Col.													
Emmets, Colo											.45		300
Exchequer, Nev.													
Independence, Nev.													
Julia, Nev.													
Justice, Nev													
Kentuck, Nev.													
Lacrosse, Colo.	.04												500
Lee Basin, Colo.													
Mexican, Nev.	1.95								1.45				200
Middle Bar, Cal.													
Monitor, Colo.													
Monte Cristo, N. S. of C.	3.30	3.25	3.30	3.25	3.30	3.30	3.30	3.45	3.50		3.55	3.50	1,200
Nevada Queen, Nev.													
N. Standard, Cal.													
N. Commonwealth, Nev.													
Occidental, Nev.													
Oriental & Miller, Nev.													
Phœnix Lead, Colo.													
Phœnix of Ariz.	.15												
Potosi, Nev.													50
Rappahannock, Va.													
S. Sebastian, S. Sal.													
Santiago													
Scorpion, Nev.													
Seg. Belcher, Nev.													
Shoshone, Idaho.													
Silver Hill, Nev.													
Sullivan Con., Dak.													
Sutro Tunnel, Nev.													
Syndicate, Cal.													
Tornado Con., Nev.											.04		300
Union Cons., Nev.													
Utah, Nev.													

*Ex-dividend. †Dealt in New York Stock Ex. Unlisted securities. ‡Assessment paid. § Assessment unpaid. Dividend shares sold, 2,500. Non-dividend shares sold, 9,650. Total shares sold, 12,150.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	Feb. 24.		Feb. 25.		Feb. 27.		Feb. 28.		Mar. 1.		Mar. 2.		SALES.
Atlantic, Mich.					10.00								22
Bodie, Cal.													
Bonanza Development.													
Bost. & Mont., Mont.	32.50	32.00	32.00	31.75	32.00	31.50	31.50		32.00	31.50	32.00		1,421
Breece, Colo.													
Calumet & Hecla, Mich.	304		304		300				305		310		55
Catalpa, Colo.													
Central, Mich.													
Cœur d'Alene, Id.													
Con. Cal. & Va., Nev.													
Dunkin, Colo.													
Eureka, Nev.													
Franklin, Mich.	12.75		12.75	12.25	12.50				13.00	12.50	13.00		710
Houghton, Utah.													
Horn Silver, Utah.													
Kearsarge, Mich.			11.00		11.00		10.75		10.75	10.63	10.50		165
Lake Superior, Iron.													
Little Pittsburg, Colo.													
Minnesota Iron, Minn.													
Napa, Cal.													
Ontario, Utah.													
Osceola, Mich.	35.00	35.50	35.50	35.13	35.00		35.00		35.50				455
Quincy, Mich.	132		132						130				35
Ridge, Mich.													
Sierra Nevada, Nev.													
Silver King, Ariz.													
Stormont, Utah.													
Tamarack, Mich.	161		161		164	158	159						182
Tecumseh, Mich.													

NAME OF COMPANY.	Feb 24.		Feb. 25.		Feb. 27.		Feb. 28		Mar. 1.		Mar. 2.		$ A
Allouez, Mich.					.75								200
Arnold, Mich.					.50				.50				300
Aztec, Mich.													
Brunswick, Cal.													
Butte & Boston, Mont.	10.38	10.00	10.25	10.00	10.10		10.25	10.00	10.75	10.50	11.03	10.88	2,275
Centennial, Mich.	8.75	8.00	8.00				8.00				9.25	8.75	887
Colchis, N. Mex.													
Copper Falls, Mich.													
Crescent, Colo.													
Dana, Mich.													
Don Enrique, Mex.													
Geyser, Colo.													
Hanover, Mich.													
Humboldt, Mich.													
Hungarian, Mich.													
Huron, Mich.													
Mesnard, Mich.													
National, Mich.									.50				100
Native, Mich.													
Oriental & M., Nev.													
Phœnix, Ariz.													
Pontiac, Mich.													
Rappahannock, Va.													
Santa Fe, N. Mex.													
Shoshone, Idaho.													
South Side, Mich.													
Tamarack, Jr., Mich.	18.50										19 00	18 00	120
Washington, Mich.													
Wolverine, Mich.	2 75	2 50							2.50				1,360

Dividend shares sold, 2,383. Non-dividend shares sold, 5,132 Total shares sold, 8,115

DIVIDEND-PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares. No.	Par	Assessments. Total levied.	Date and amount of last			Dividends. Total paid.	Date & amount of last.		
1	Adams, s. L. C.	Colo..	$1,500,000	150,000	$10	*				$637.500	Jan..	1892 .05
2	Alaska-Treadwell, g.	Al'ska	5,000,000	200,000	25					1,450,000	Oct.	1892 .37½
3	Ance, s.	Mont.	10,000,000	400,000	25	*				975,000	Nov.	1891 .06¼
4	Alma & Nel Wood., G	Idaho	300,000	30,000	10	*				60,000	Jan:	1889 .50
5	Amador, G.	Cal.	1,250,000	250,000	5	*				31,250	Aug..	1890 .12½
6	American, G.	Colo..	3,000,000	300,000	10	*				225,000	Mar..	1892 .05
7	American Belle, S.G.C	Colo.	2,000,000	400,000	5	*				50,000	April	1891 .12½
8	Americ'n & Nettie, G.S	Colo..		300,000						175,000	Mar..	1892 .05
9	Atlantic, C.	Mich..	1,000,000	40,000	25	280,000	April	1875	$1.00	700,000	Feb..	1891 1.00
10	Argenta, S.	Nev..	10,000,000	100,000	100	335,000	July.	1889	.10	40,000	Feb..	1880 .20
11	Argyle, G.	Colo..	1,000,000	1,000,000	1	*				20,000	Mar.	1892 .01
12	Aspen Mg. & S., S. L.	Colo..	2,000,000	200,000	10	*				760,000	Sept.	1892 .10
13	Aurora, I.	Mich..	2,500,000	100,000	25					455,000	June	1892 1.00
14	Badger, S.	Ont..	250,000	50,000	5					37,500	Mar.	1890 .25
15	Bald Butte	Mont	250,000	250,000	1	*				72,500	Mar..	1892 .03
16	Bates Hunter., S. G.	Colo..	1,000,000	1,000,000	1						Dec..	1891 .00½
17	Belle Isle, S.	Nev..	10,000,000	100,000	100	220 00	Aug.	1892	.10	300,000	Dec..	1879 .25
18	Belcher, S. G.	Nev..	10,400,000	104,000	100	3,16 000	May	1892	.25	15,397,000	April	1876 1.00
19	Bellevue, Idaho, S. L.	Idaho	1,250,000	125,000	10	1: 000	Dec..	1889	.25	200,000	Jan..	1890 .10
20	Best Friend.	Colo.	1,000,000	1,000,000	1					90,000	Feb..	1892 .01
21	Bi-Metallic, S. G.	Mont.	5,000,000	200,000	25					2,22 1,000	Feb..	1893 .20
22	Bodie Con., G. I.	Cal..	10,000,000	100,000	100	0,000	June	1890	.25	1,602,572	April	1885 .50
23	Boston & Mont., G.	Mont.	2,500,000	250,000	10	*				520,000	June	1886 .15
24	Boston & Mont., C. S.	Mont.	3,125,000	125,000	25	*				2,075,000	Nov..	1891 1.00
25	Brooklyn Lead, L. S.	Utah.	500,000	50,000	10					127,000	July.	1887 05
26	Bulwer, G.	Cal..	10,000,000	100,000	10	30,000	Aug..	1889	.25	190,000	Oct..	1892 .05
27	Bunker Hill & S.S.L.	Idaho	3,000,000	300,000	10	*				150,000	Oct.	1888 .06⅜
28	Caledonia, G.	Dak..	10,000,000	100,000	100	505,000	May.	1885	.15	192,000	Oct..	1890 .08
29	Calliope, S.	Colo..	1,000,000	1,000,000						140,000	Jan.	1891 .00½
30	Calumet & Hecla C	Mich..	2,500,000	100,000	25	1,200,000				38,850,000	Dec.	1892 5 00
31	Centen'l-Eureka, S.L.	Utah.	1,500,000	30,000	50					607,500	Feb	1893 .50
32	Central, C.	Mich..	500,000	20,000	25	100,000	Oct..	1861	.65	1,970,000	Feb..	1891 1.00
33	Champion, G	C		34,000	10					114,900	Dec	1892 .10
34	Chrysolite, S. L.	Colo..	10,000,000	200,000	50	*				1,650,000	Dec..	1884 .25
35	Clay County, G.	Colo..	200,000	200,000	1	*				56,000	Nov..	1891 .02
36	Clinton Con, G.	Cal..	5,000,000	100,000	5					80,000	Nov..	1891 .10
37	Cœur D'Arene, S. L.	Idaho	5,000,000	500,000	10					310,000	Nov.	1891 .02
38	Colorado Central, S.L.	Colo..	2,750,000	275,000	10	*				502,500	Jan..	1892 .05
39	Commonwealth, S.	Nev..	10,000,000	100,000	100	190,000	Sept.	1892	.10	30,000	Nov.	1890 .20
40	Confidence, S. L.	Nev..	2,496,000	24,960	100	1,589,550	Aug..	1892	.50	199,680	April	1889 1.00
41	Cons. Cal. & Va., S.G	Nev..	21,600,000	216,000	100	108,000	Jan..	1885	.20	3,682,800	Aug.	1891 .50
42	Contention, S.	Ariz..	12,500,000	25,000	50					2,637,500	Aug.	1892 .20
43	Cook's Peak, S.	N. M..	2,000,000	200,000	10					114,532	Nov	1892 .05
4	Cop. Queen Con., C.	Ariz..	2,000,000	200,000	10					1,360,000	Feb.	1893 .50
4	Coptis	Nev.	10,000,000	100,000	100	*				67,000	July..	1892 .12
46	Cortez, S.	Nev..	1,500,000	30,000	05	*				687,000	Mar..	1892 .50
47	Crescent, S. L. G.	Utah..	15,000,000	90,000	25	60,000	Oct.	1892	.10	238,000	Oct..	1888 .03
48	Crown Point, G. S.	Nev..	10,000,000	100,000	100	2,700,000	Sept.	1892	.25	11,898,000	Jan..	1875 2.00
49	Cumberland, L. S.	Mont.	5,000,000	500,000	10	*				15,000	Nov.	1889 .03
50	Daly, S. L.	Utah.	3,000,000	150,000	20					2,687,5 0	Feb.	1893 .25
51	Deer Creek, S. G.	Idaho	1,000,000	200,000	5	*				20,000	June	1889 .05
52	Deadwood-Terra, G.	Dak..	5,000,000	200,000	25	*				1,150,000	Oct..	1892 .05
53	DeLamar, S. G.	Idaho	2,000,000	40,000	5	*				550,000	Oct..	1892 .25
4	Derbec B. Grav., G.	Cal..	10,000,000	100,000	100	100,000	Sept.	1892	.10	60,000	Aug..	1891 .10

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares. No.	Par	Assessments. Total levied.	Date and am't of last.	
1	Alliance, S. G.	Utah.	$100,000	100,000	$1	$120,000	Feb.. 1891 .20
2	Allouez, C.	Mich.	2,000,000	80,000	25	737,000	Jan.. 1890 .70
3	Alpha Con., G. S.	Nev..	3,000,000	30,000	100	300,000	Sept. 1892 .10
4	Alta, S.	Nev..	10,080,000	100,800	100	2,363,880	Jan. 1892 .10
5	American, C.	Idaho	5,000,000	500,000	10		
6	American Flag, S.	Colo..	1,250,000	125,000	1	300,000	June 1887 ....
7	Amity, S.	Colo..	250,000	250,000	20		
8	Anchor, S. L. G.	Utah.	3,000,000	150,000	5	410,000	June 1890 .20
9	Anglo-Montana, Lt.	Mont.	600,000	120,000	125		
10	Appalachian, g.	N. C.	1,750,000	1,400,000	20		
11	Arizona, C.	Ariz..	3,575,000	160,000	2		
12	Astoria, G.	Cal..	200,000	100,000	5		
13	Atlanta, G. S.	Idaho	3,250,000	650,000	25		
14	Barcelona, G.	Nev..	5,000,000	200,000	5	*	
15	Bear Creek	Idaho	100,000	20,000	1		
16	Belmont, G.	Cal..	500,000	500,000	100	*	
17	Belmont, S.	Nev..	5,000,000	50,000	100	735,000	April 1886 .10
18	Best & Belcher, S. G.	Nev..	10,080,000	100,800	10	2,405,275	Aug. 1892 .25
19	Black Oak, G.	Cal..	3,000,000	300,000	100	*	
20	Boston Con., G.	Cal..	10,000,000	100,000	1	170,000	Nov. 1887 .25
21	Brownlow, G.	Colo..	250,000	250,000	5		
22	Brunswick, G.	Cal..	2,000,000	400,000	2		
23	Buckeye, S. L.	Mont.	1,000,000	500,000	100		
24	Bullion, S. G.	Nev.	10,000,000	100,000	100	2,890,000	Aug 1889 .25
25	Burlington, G. S.	Cal..	10,000,000	100,000			
26	Butte & Boston, C. S.	Mont.	5,000,000	200,000	10		
27	Butte Queen, G.	Cal..	1,000,000	100,000	1	6,000	Jan.. 1892 .04
28	Calaveras, G.	Cal..	500,000	500,000	5		
29	Calaveras Con., G.	Cal..	800,000	160,000	10		
30	California, S.	Cal..	1,000,000	100,000	5	9,000	Mar. 1892 .03
31	California Con. Q.	Cal..	2,250,000	450,000	10		
32	Camille, G.	Ga.	1,500,000	150,000	5		
33	Carisa, G.	Wy..	500,000	100,000	2	*	
34	Carupano, G. S. L. C.	Ven..	200,000	100,000	2	*	
35	Cashier, G. S.	Colo..	500,000	250,000	100	*	
36	Challenge Con., G. S.	Nev..	5,000,000	50,000	10		
37	Cherokee, G.	Cal..	1,500,000	150,000	100		
38	Chollar, S. G.	Nev..	11,200,000	112,000	2	1,820,000	May. 1892 .50
39	Cleveland, T.	Dak..	1,000,000	500,000	10	*	
40	Colchis, S. G.	N. M..	500,000	150,000	5		
41	Colorado, S	Colo..	1,625,000	325,000	1		
42	Comstock, S.	Utah.	1,250,000	250,000	100		
43	Comstock Tun.	Nev..	10,000,000	100,000	100	35,000	Mar. 1887 .15
44	Con. Imperial, G. S	Nev..	5,000,000	50,000	50	2,062,500	Jan. 1892 .25
45	Con. New York, S. G.	Nev..	5,000,000	100,000	100	110,000	Mar.. 1892 .10
46	Con. Pacific, G.	Cal..	6,000,000	60,000	10	198,000	June 1890 .10
47	Con. Silver, S.	Mo..	2,500,000	250,000	5		
48	Cordova Union, G.	Cal..	1,000,000	200,000	10		
49	Crescent, S. L.	Colo..	3,000,000	300,000	100	*	
50	Crocker, S.	Ariz..	10,000,000	100,000	1	165,000	Aug. 1892 .05
51	Crowell, G.	N. C..		500,000	100		
52	Dahlonega, G.	Ga..		250,000	10	*	
53	Dandy, S.	Colo.	5,000,000	500,000			
54	Decatur, S.	Colo..	1,500,000	300,000			

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares		Assessments.			Dividends.	
				No.	Par	Total Levied.	Date and amount of last		Total paid.	Date & amount of last.
57	Dexter, g. s	Nev..	1,000,000	100,000	10	.....	.....	.....	80,000	Aug.. 1892 .25
58	Dunkin, s. L	Colo..	5,000,000	200 00	25	*	.....	.....	395,000	Oct.. 1889 .05
57	Elkhorn, s. L	Mont.	1,000,000	200 00	5	*	.....	.....	885,545	Dec.. 1892 .50
58	Enterprise, s.	Colo..	2,500,000	50,000	5	*	.....	.....	750,000	Feb. 1893 .05
59	Eureka Con., s. L. G.	Nev...	1,000,000	50,000	100	550,000	June 1889	.50	5,017,500	Jan 1892 .25
60	Evening Star, s. L	Colo..	500,000	50,000	10	*	.....	.....	1,450,000	Dec. 1889 .2
61	Father de Smet, G	Dak..	10,000,000	100,000	100	200,000	Nov.. 1878	1.00	1,125,000	Dec.. 1885 .20
62	Franklin, C	Mich..	1,000,000	40,000	25	220,000	June 1871	.....	1,106,000	July 1892 2.00
63	Freeland, s. G	Colo..	5,000,000	200,000	25	*	.....	.....	190,000	July. 1886 .10
64	Garfield Lt., G. S.	Nev ..	500,000	100,000	5	.....	.....	.....	90,000	April 1888 .12½
65	Glengarry	Mont.	1,000,000	100,000	10	.....	.....	.....	10,000	June 1891 .10
66	Gold Rock	Colo..	500,000	500,000	1	.....	.....	.....	.....	Dec.. 1891 .01
67	Golden Reward	S.Dak	1,250,000	250,000	5	.....	.....	.....	75,000	Feb. 1893 .02
68	Gould & Curry, s. G.	Nev...	10,800,000	108,000	100	4,591,200	June 1892	.25	3,826,800	Oct.. 1870 10.00
69	Grand Prize, s	Nev...	10,000,000	100,000	100	785,000	Jan.. 1890	.30	495,000	Mar. 1884 .25
70	Granite, s. L	Idaho	500,000	500,000	1	*	.....	.....	83,400	Nov.. 1890 .02
71	Granite Mountain, s.	Mont.	10,000,000	400,000	25	.....	.....	.....	12,120,000	July. 1892 .20
72	Great Western, L. Q	Cal...	5,000,000	50,000	100	.....	.....	.....	394,861	Dec. 1892 .25
73	Green Mountain, G	Cal...	1,250,000	125,000	10	*	.....	.....	212,500	Nov.. 1881 .07½
74	Hale & Norcross, G. S.	Nev...	11,200,000	112,000	100	5,534,800	Aug.. 1892	.50	1,822,000	Aug. 1888 .50
75	Hecla Con., S. G. L. C.	Mont.	1,500,000	30,000	50	.....	.....	.....	1,950,000	Feb. 1893 .50
76	Hel'a Mg.& Red,s.L.G.	Mont.	3,315,000	663,000	5	*	.....	.....	197,970	July. 1886 .06
77	Helena & Frisco, s.L.	Idaho	2,500,000	500,000	5	.....	.....	.....	170,000	July.. 891 .02
78	Helena & Victor	Mont.	1,000,000	200,000	5	.....	.....	.....	80,000	May.. 1891 .05
79	**Holmes, s	Nev...	10,000,000	100,000	100	370,000	May. 1890	.25	75,000	April 1888 .25
80	Homestake, G	Dak..	12,500,000	125,000	100	200,000	July. 1878	1.00	4,953,750	Feb.. 1893 .10
81	Honorine, s. L	Utah.	500,000	250,000	2	37,500	April 1889	.05	125,000	Sept. 1887 .05
82	Hope, s	Mont.	1,000,000	100,000	10	*	.....	.....	408,252	Feb. 1893 .50
83	Horn-Silver, s. L	Utah.	10,000,000	400,000	25	*	.....	.....	4,650,000	Dec. 1892 .12½
84	Hubert, G	Colo..	1,000,000	1,000,000	1	*	.....	.....	247,000	Dec.. 1889 .00½
85	Idaho, G	Cal...	310,000	3,100	100	.....	.....	.....	5,419,250	Dec. 1892 2.50
86	Illinois, s	N. M..	100,000	100,000	1	*	.....	.....	45,000	April 1889 .20
87	Iron Hill, s	Dak..	2,500,000	250,000	10	134,000	July. 1889	.03	156,250	Nov.. 1887 .07½
88	Iron Mountain, s	Mont.	5,000,000	500,000	10	*	.....	.....	215,000	Aug. 1892 .03
89	Iron-Silver, s. L	Colo..	10,000,000	500,000	20	*	.....	.....	2,500,000	April 1889 .20
90	Jack Rabbit, G	Cal...	10,000,000	100,000	100	100,000	Sept. 1892	.10	265,000	Aug. 1891 .10
91	Jackson, G. S	Nev..	5,000,000	50,000	100	237,500	Nov.. 1880	.20	60,000	Jan. 1891 .10
92	Kearsarge, C	Mich..	1,000,000	40,000	25	190,000	Oct.. 1887	1.00	80,000	Jan. 1890 2.00
93	Kennedy	Cal...	10,000,000	100,000	100	.....	.....	.....	387,000	May.. 1892 .15
94	Kentuck, S. G	Nev...	3,000,000	30,000	100	454,180	Oct.. 1891	.15	1,350,000	Dec. 1886 .10
95	La Plata, S. L	Colo..	2,000,000	200,000	10	*	.....	.....	610,000	Sept. 1882 .30
96	Leadville Con., S. L	Colo..	4,000,000	400,000	10	*	.....	.....	304,000	May.. 1892 .03
97	Lexington, G. S.	Mont.	4,000,000	40,000	100	*	.....	.....	609,000	Jan.. 1890 2.00
98	Little Chief, S. L	Colo..	10,000,000	200,000	50	*	.....	.....	820,000	Dec.. 1890 .05
99	Little Rule, s	Colo..	500,000	500,000	1	.....	.....	.....	220,000	Dec.. 1891 .02
100	Maid of Erin	Colo..	3,000,000	600,000	5	.....	.....	.....	557,757	April 1892 .25
101	Mammoth, S. L. C	Utah.	10,000,000	400,000	250	110,000	.....	1882	1,040,000	Dec... 1891 .10
102	Martin White, s	Nev..	10,000,000	100,000	100	1,275,000	Jan.. 1892	.25	140,000	Dec.. 1886 .25
103	Mary Murphy, S. G	Colo..	350,000	3,500	101	*	.....	.....	175,000	May.. 1888 5.00
104	Matchless, S. L	Colo..	500,000	500,000	1	*	.....	.....	15,000	Feb. 1890 .00½
105	Maxfield	Utah.	3,000,000	300,000	10	.....	.....	.....	117,000	April 1892 .03
106	Mayflower, D. gravel	Cal...	1,000,000	100,000	10	.....	.....	.....	100,000	Dec.. 1892 .25
107	May Mazeppa, S. L	Colo..	1,000,000	100,000	1	.....	.....	.....	205,000	Oct.. 1891 .03¾
108	Minas Prietas, G. S	Mex..	1,000,000	100,000	10	*	.....	.....	350,000	Dec.. 1890 .50
109	Minnesota, C	Mich..	1,000,000	40,000	25	420,000	April 1886	1.00	1,820,000	Mar. 1876 .....
110	Mollie Gibson, S	Colo..	5,000,000	1,000,000	5	.....	.....	.....	2,850,000	Jan 1893 15
111	Monitor, G	S.Dak	2,500,000	250,000	10	.....	.....	.....	45,000	Oct.. 1890 .03
112	Mono, G	Cal...	5,000,000	50,000	100	760,000	Sept. 1890	.25	12,500	Mar 1886 .25
113	Montana, Lt., G. S	Mont.	3,300,000	660,000	5	*	.....	.....	2,619,075	June. 1891 12½
114	Morning Star, S. L	Colo..	1,000,000	100,000	10	.....	.....	.....	925,000	April 1891 .25
115	Morning Star Drift, G	Cal...	240,000	2,400	100	.....	.....	.....	111,800	Dec.. 1892 3.00
116	Moulton, S. G	Mont.	2,000,000	400,000	5	*	.....	.....	410,000	Nov. 1892 .07½
117	Mt. Diablo, S	Nev..	5,000,000	50,000	100	137,500	June 1880	2.00	210,000	July. 1891 .20
118	Napa, Q	Cal...	700,000	100,000	7	.....	.....	.....	520,000	Jan. 1893 .20
119	Navajo, G. S	Nev..	10,000,000	100,000	100	520,000	May. 1891	20	229,950	April 1889 .10
120	Newton	Cal...	10,000,000	103,000	100	.....	.....	.....	10,000	May.. 1891 .05
121	New California, G	Colo..	800,000	160,000	5	*	.....	.....	48,800	May.. 1890 .12½
122	New Guston, S	Colo..	550,000	110,000	5	.....	.....	.....	1,877,500	April 1892 .75
123	North Banner Con	Cal...	1,000,000	100,000	10	.....	.....	.....	20,000	July.. 1891 .05
124	North Commonw'th	Nev..	10,000,000	100,000	100	.....	.....	.....	25,000	June. 1891 .25
125	N. Hoover Hill, G. S.	N. C..	120,000	120,000	2½	*	.....	.....	30,000	Dec.. 1885 .06½
126	North Belle Isle, S	Nev..	10,000,000	100,000	100	474,689	Nov. 1892	.10	230,000	May 1888 .50
127	North Star, G	Cal...	1,000,000	100,000	10	.....	.....	.....	350,000	Dec.. 1892 .50
128	Omaha Cons., G	Cal...	2,400,000	24,000	100	.....	.....	.....	30,000	May.. 1892 .15
129	Ontario, S. L	Utah	15,000,000	150,000	100	.....	.....	.....	13,175,000	Oct.. 1892 .50
130	Ophir, G. S	Nev..	10,000,000	100,000	100	4,210,640	April 1890	.50	1,595,800	Jan.. 1880 1.00
131	Original, S. C	Mont.	1,500,000	60,000	25	*	.....	.....	138,000	Jan.. 1889 .05
132	Oro, S. L. G	Colo..	500,000	100,000	5	.....	.....	.....	95,000	July. 1890 .20
133	Osceola, C	Mich..	1,250,000	50,000	25	480,000	April 1876	1.60	1,697,500	Dec. 1892 1.00
134	Pacific Coast, B	Cal...	1,500,000	15,000	100	.....	.....	.....	360,000	Dec. 1892 1.00
135	Parrot, C	Mont.	1,800,000	180,000	10	.....	.....	.....	1,405,385	Dec. 1892 .10
136	Petro	Utah.	10,000,000	10,000	100	.....	.....	.....	17,500	July. 1891 .15
137	Plumas Eureka, G	Cal...	1,406,250	140,625	10	.....	.....	.....	2,643,559	April 1892 .18
138	Plymouth Con, G	Cal...	5,000,000	100,000	50	*	.....	.....	2,280,000	Feb. 1888 .40
139	Poorman, G. S	Idaho	375,000	300,000	125	*	.....	.....	68,260	Sept 1892 .....
140	Quicksilver, pref., Q	Cal...	4,300,000	43,000	100	.....	.....	.....	1,822,911	June 1891 1.25
141	" com., Q	Cal...	5,700,000	57,000	100	.....	.....	.....	646 867	July. 1882 .40
142	Quincy, C	Mich..	1,250,000	50,000	25	200,000	Dec.. 1862	.....	6,470,000	Feb. 1893 3.00
143	Red Cloud	Idaho	1,000,000	200,000	5	.....	.....	.....	153,000	Dec. 1892 .10
144	Reed National, S. G.	Colo..	500,000	500,000	1	*	.....	.....	50,000	Dec. 1890 .01
145	Retriever, L	S.Dak	1,250,000	250,000	5	.....	.....	.....	20,000	Aug.. 1891 .03
146	Rialto, G	Colo..	300,000	300,000	1	*	.....	.....	50,250	April 1892 .01½
147	Richmond, S. L	Nev.	1,350,000	54,000	25	*	.....	.....	4,346,325	Aug.. 1891 .25
148	Ridge, C	Mich..	500,000	20,000	25	219,939	Mar. 1886	50	99,785	Feb.. 1886 .50
149	Robinson Con., S. L.	Colo..	10,000,000	200,000	50	*	.....	.....	585,000	Mar 1886 .05
150	Running Lode, G	Colo..	1,000,000	1,000,000	1	*	.....	.....	36,000	May.. 1892 00 10
151	Savage, S	Nev..	11,200,000	112,000	100	6,772,000	Feb.. 1892	.50	4,460,000	June 1869 3.00
152	Sheridan, S. G	Colo.	300,000	3,000	100	*	.....	.....	300,000	Oct.. 1891 2.50
153	Shoshone, G	Idaho	150,000	150,000	1	.....	.....	.....	7,500	April 1885 .01
154	Sierra Buttes, G	Cal...	2,225,000	122,500	10	.....	.....	.....	1,529,367	Oct. 1892 .18
155	Sierra Nevada, S. G.	Nev..	11,000,000	100,000	100	6,411,916	June 1892	.25	102,000	Jan.. 1871 1.00
156	Sierra Nevada, S. L.	Idaho	1,000,000	1,000,000	1	*	.....	.....	40,000	May.. 1889 .02
157	Silent Friend	Colo..	500,000	500,000	1	.....	.....	.....	60,000	Aug.. 1891 .02½
158	Silver Cord, S. L. G	Colo..	4,500,000	450,000	10	.....	.....	.....	265,000	April 1889 .10
159	Silver King, S	Ariz..	13,000,000	100,000	100	130,000	Nov. 1890	.30	1,950,000	July 1885 .25
160	Silver Mg.of L.V.,S.L.	N. M..	500,000	500,000	1	.....	.....	.....	300,000	Dec.. 1891 4 05
161	Silde	Colo..	500,000	5,000	100	.....	.....	.....	20,000	Nov.. 1891 4.00
162	Small Hopes Con., S.	Colo..	5,000,000	250,000	20	*	.....	.....	52,000,000	Nov. 1892 .15
163	Spring Valley, G	Cal...	300,000	300,000	1	50,000	Oct. 88	.25	50,000	Jan. 1881 .25
164	Standard, G. S	Cal...	10,000,000	100,000	100	100,000	June 89	.50	3,655,000	Mar.. 1892 .10
165	Stormont, S	Utah.	500,000	500,000	1	*	.....	.....	155,000	Nov. 1881 .05
166	St. Joseph, L	Mo..	1,500,000	150,000	10	*	.....	.....	1,974,000	Dec.. 1890 .02
167	Swansea, g. s	Colo..	600,000	60,000	10	.....	.....	.....	27,000	Mar. 1893 .10
178	Tamarack, C	Mich..	1,250,000	50,000	25	520,000	Aug. 9	3.00	3,160,000	Oct. 1892 .00
169	Teal & Poe	N. M..	150,000	150,000	1	.....	.....	.....	9,000	Nov. 1891 .01½
170	Tombstone, G. S. L	Ariz..	12,500,000	500,000	25	*	.....	.....	1,250,000	April 1882 .10
171	United Verde, C	Ariz..	3,000,000	300,000	10	*	.....	.....	207,500	Jan.. 1892 .10
172	Viola Lt., S. L	Idaho	750,000	150,000	5	.....	.....	.....	337,500	Nov. 1888 .37½
173	Ward Con., S	Colo.	2,000,000	200,000	10	.....	.....	.....	20,000	Dec. 1888 .05
174	Woodside, S. L	Utah	100,000	100,000	10	.....	.....	.....	25,000	Oct.. 1888 .25
175	W. Y. O. D	Cal..	30,000	15,000	4	22,500	May. 1891	.10	42,000	Dec. 1892 .10
176	Yankee Girl, S	Colo.	1,300,000	260,000	5	.....	.....	.....	1,406,000	April 1891 1.50
177	Yellow Jacket, G. S.	Nev	12,000,000	120,000	10	5,808,000	Sept 1892	.25	2,184,000	Aug. 1871 1.50
178	Yosemite No. 2	Utah.	1,000,000	100,000	10	.....	.....	.....	25,000	Oct.. 1891 .05
179	Young America, G	Cal...	.....	.....	.....	.....	.....	.....	175,000	Jan.. 188 1.00

NON DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares.		Assessments.	
				No.	Par	Total levied	Date and am't of last.
55	Denver City, s	Colo..	5,000,000	500,000	11	*	....
56	Denver Gold, G	Colo..	300,000	60,000	5	.....	....
57	Dickens-Custer, s	Idaho	2,100,000	420,000	5	.....	....
5	Durango, G	Colo..	500,000	500,000	1	*	....
59	Eastern Dev. Co., Lt	N. S..	1,500,000	150,000	10	990,000	Mar. 1886 1.00
60	El Dorado, G	Cal...	1,000,000	250,000	4	*	....
61	El Talento, G	U.S.C.	1,000,000	500,000	2	.....	....
62	Emma, s	Utah.	625,000	500,000	125	.....	....
63	Emmons, S. L	Colo..	2,000,000	2,000,000	1	.....	....
64	Empire, S	Utah.	10,000,000	100,000	100	.....	....
65	Eureka Tunnel, S. L.	Nev...	10,000,000	100,000	100	*	....
66	Exchequer, S. G.	Nev...	10,000,000	100,000	100	940,000	Jan.. 1892 .25
67	Found Treasure, G. S.	Nev...	10,000,000	100,000	100	130,500	Jan.. 1892 .50
68	Gogebic I. Syn., I	Wis..	5,600,000	200,000	25	.....	....
69	Gold Bank, g. s	Colo.	250,000	250,000	1	*	....
70	Gold Cup, s	Colo..	500,000	500,000	1	*	....
71	Golden Era, s	Mont.	2,000,000	200,000	10	*	....
72	Gold Flat, G	Cal...	1,000,000	100,000	10	5,000	Mar.. 1892 .05
73	Gold King, g	Colo..	1,650,000	350,000	5	.....	....
74	Gold Rock, G	Cal...	1,000,000	500,000	2	.....	....
75	Golden FeatherCu., g	Cal...	900,000	180,000	5	.....	....
76	Goodshaw, G	Cal...	10,000,000	100,000	100	*	....
77	Goodyear G. S. L	Mont.	1,000,000	200,000	5	13,000	Feb.. 1892 .01
78	Grand Belt, C	Tex..	12,000,000	120,000	100	.....	....
79	Grand Canyon, s	Ariz..	375,000	75,000	5	.....	....
80	Grand Duke, s	Colo..	800,000	80,000	10	.....	....
81	Gregory Con., G	Mont.	3,000,000	300,000	10	.....	....
82	Harlem M. & M. Co., G.	Cal...	1,000,000	200,000	5	.....	....
83	Hartery Con., G	Cal...	1,000,000	100,000	10	22,000	Oct.. 1890 .05
84	Hartshorn, g s. l.	S.Dak	1,250,000	250,000	5	8,750	Sept. 1891 .00½
85	Head Cent. & Tr., S. G	Ariz..	10,000,000	100,000	100	16,381	Mar.. 1892 .03
86	Hector, G	Cal...	1,500,000	300,000	5	45,000	Jan.. 1889 .15
87	Highland, C	Mich..	500,000	25,000	20	.....	....
88	Himalaya, g. s. l	Utah.	1,800,000	180,000	10	12,800	Oct. 1892 .00½
89	Holywood	Cal...	200,000	100,000	2	.....	....
90	Hortense, s	Colo.	2,000,000	200,000	10	.....	....
91	Huron, C	Mich..	1,000,000	40,000	25	280,000	May. 1887 3.00
92	Idaho, g. s	Idaho	1,250,000	250,000	5	.....	....
93	Inez, s. L	Idaho	1,000,000	1,000,000	1	.....	....
94	Ingalls, g	Colo..	100,000	20,000	5	.....	....
95	Ironton, L	Wis.	1,000,000	40,000	25	.....	....
96	Iroquois, C	Mich..	1,250,000	50,000	25	.....	....
97	Kentuck Con	Nev..	10,500,000	105,000	100	57,750	July. 1892 .10
98	J. D. Keymert, s	Ariz..	10,000,000	100,000	100	.....	....
99	Julia Con., G. S.	Nev...	11,000,000	110,000	100	1,463,000	Jan.. 1889 .10
100	Justice, g. s. c	Colo.	500,000	500,000	1	*	....
101	Lacrosse, G	Colo..	1,000,000	100,000	10	*	....
102	La Cumbre, g. s	Mex..	150,000	3,000	50	*	....
103	Lee Basin, s	Colo..	5,000,000	500,000	10	*	....
104	Little Josephine, s	Colo..	250,000	50,000	5	.....	....
105	Lone star Cons., G	Cal...	500,000	500,000	1	10,000	April 1892 .00½
106	Lynx Creek, g	Ariz..	295,500	147,500	5	.....	....
107	Madeleine, G. S. L	Colo..	750,000	50,000	1	4,500	Feb. 1892 .00½
108	Mammoth Gold, G	Ariz..	245,000	49,000	5	*	....
109	Mayflower Gravel, G.	Cal...	1,000,000	100,000	10	*	....
110	Medora, G	Dak..	250,000	250,000	1	585,000	Mar. 189 .56
111	Merrimac Con., G. S.	Colo..	5,000,000	500,000	10	.....	....
112	Mexican, G. S	Nev...	10,000,000	100,000	100	2,917,560	ct.. 1892 .50
113	Michigan, g s	Mich..	2,500,000	100,000	25	40,000	Mar.. 1892 .....
114	Middle Bar, G	Cal...	400,000	200,000	2	*	....
115	Mike & Starr, s. C	Colo..	1,000,000	200,000	5	*	....
116	Milwaukee, S	Mont.	500,000	500,000	1	*	....
117	Minah Cons	Mont.	1,250,000	250,000	5	.....	....
118	Modoc Chief, I. s. g.	Idaho	1,000,000	200,000	5	5,000	Jan.. 1892 .00½
119	Monnor, G	Colo..	100,000	100,000	1	12,500	May. 1891 .10
120	Montreal, G. S. L	Utah.	750,000	150,000	5	4,500	Feb.. 1892 .00½
121	Mountain Ledge, g	Cal..	500,000	100,000	5	.....	....
122	Mount McClellan	Colo.	1,500,000	300,000	5	.....	....
123	Mutual Mg. & Sm	W'sh.	100,000	100,000	1	*	....
124	Native, C	Mich..	1,000,000	40,000	25	.....	....
125	Neath, G	Colo..	1,000,000	100,000	10	.....	....
126	Nelson	Cal...	50,000	10,000	5	.....	....
127	Nevada Queen, S	Nev...	10,000,000	100,000	100	200,000	Oct.. 1889 .25
128	New Germany, G	N. S..	100,000	100,000	1	*	....
129	New Gold Hill	N. C	1,750,000	350,000	5	.....	....
130	New Pittsburg, S. L.	Colo..	2,000,000	200,000	10	*	....
131	New Queen Gold, S.	Colo..	800,000	160,000	5	.....	....
132	North Standard, G	Cal...	10,000,000	100,000	100	20,000	Nov ....
133	Occidental Con., g. s		10,000,000	100,000	100	245,000	April 1892 .20
134	Oneida Chief, G	Cal...	500,000	125,000	100	*	....
135	Oriental & Miller, S.	Nev...	10,000,000	400,000	100	.....	....
136	Original Keystone, S.	Nev..	10,000,000	100,000	100	250,000	Mar.. 1892 .10
137	Osceola, G	Nev...	5,000,000	500,000	10	*	....
138	Overman, G. S	Nev...	11,520,000	115,200	100	4,001,840	May. 1892 .10
139	Park, S	Utah.	2,000,000	200,000	10	.....	....
140	Parker, G	N. C..	750,000	180,000	.....	.....	....
141	Pay Rock, S	Colo..	1,000,000	200,000	5	.....	....
142	Pear, S	Ariz..	10,000,000	100,000	100	180,000	Feb.. 1892 .10
143	Peerless, S	Ariz..	10,000,000	100,000	100	405,000	Oct.. 1890 .15
144	Pennsylva'a Cons., G	Cal...	5,150,000	515,000	10	36,050	Feb.. 1892 .10
145	Phœnix, G	Ariz..	500,000	500,000	1	*	....
146	Phœnix Lead, S. L	Colo..	100,000	100,000	1	*	....
147	Pilgrim, G	Cal...	600,000	300,000	2	*	....
148	**Pioche M.&R.,S.G.L.	Utah.	20,000,000	2,000,000	10	.....	....
149	Poorman, Ltd., S. L.	Idaho	250,000	50,000	5	.....	....
150	Potosi, S	Nev...	11,200,000	112,000	100	1,573,000	Mar.. 1890 .50
151	Proustite, S	Idaho	250,000	250,000	1	*	....
152	Puritan, S. G	Colo..	1,500,000	150,000	10	*	....
153	Quincy, C	Colo..	3,000,000	300,000	10	.....	....
154	Rainbow, G	S.Dak	1,250,000	250,000	5	4,250	July. 1892 .00½
155	Rappahannock, G. S.		250,000	250,000	1	*	....
156	Red Elephant, S	Colo..	500,000	500,000	1	*	....
157	Red Mountain, S	Colo..	300,000	60,000	5	.....	....
158	Ropes, G. S	Mich..	2,000,000	80,000	25	167,200	Feb. 1891 .50
159	Ruby & Dun., S. L. G.	Nev..	25,300	506	50	.....	....
160	Russell, G	N. C.	1,500,000	300,000	5	.....	....
161	Sampson, G. S. L	Utah.	10,000,000	100,000	100	288,154	July. 1888 1.08
162	Seal of Nevada, G. S.	Nev..	5,000,000	100,000	50	.....	....
163	Silver Age, s l. g	Colo..	2,000,000	200,000	10	*	....
164	Silver Bell, S	Ariz..	850,000	170,000	5	.....	....
165	Silver King, S	Cal..	2,000,000	400,000	5	.....	....
166	Silver Queen, G	Ariz..	5,000,000	200,000	25	*	....
167	Silverton, S	Colo..	300,000	60,000	5	.....	....
168	Siskiyou Con., L	Cal...	2,000,000	200,000	10	13,000	May.. 1892 .01½
169	South Bulwer, G	Cal..	10,000,000	100,000	100	100,000	May. 1881 .25
170	South Hite, G	Cal..	10,000,000	100,000	100	195,000	Jan.. 1883 .05
171	South Pacific, G	Cal...	500,000	100,000	5	.....	....
172	Stanislaus, G	Cal...	2,000,000	200,000	10	.....	....
173	St. Kevin, S. G	Colo.	100,000	100,000	1	*	....
174	St. Louis & Mex., S	Mex..	500,000	500,000	10	*	....
175	St. Louis & St. Elmo	Colo..	1,000,000	200,000	10	.....	....
176	St. L. & St. Felipe, G. S.	Mex..	150,000	150,000	10	*	....
177	St. L. & Sonora, G. S.	Ariz..	3,000,000	300,000	10	*	....
178	Stenwinder, l. s	Idaho	500,000	500,000	1	.....	....
179	Sunday Lake, I	Mich..	1,250,000	50,000	25	.....	....
180	Sullivan Con., G	Dak..	600,000	200,000	3	*	....
181	Sylvanite, S	Colo..	5,000,000	500,000	10	*	....
182	Taylor-Plumas, G	Cal..	325,000	65,000	5	3,575	Mar.. 1892 .01½
183	Telegraph, g. s	Cal..	325,000	65,000	5	3,575	Mar. 1892 .01½
184	Telegraph, G. S	Mex..	100,000	100,000	1	70,000	Feb.. 1892 .10
185	Teresa, G. S	Cal...	1,000,000	200,000	5	10,000	Feb.. 1888 .10
186

COAL AND COAL RAILROAD STOCKS.

NAMES OF STOCKS.	Feb. 25.		Feb. 27.		Feb. 28.		March 1.		March 2.		March 3.		Sales.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Am. Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Balt. & Ohio	93	.....	93	.....	93	.....	.....	.....	.....	.....	93⅜	93	440
do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Buff., R. P	34	.....	33½	33	34	.....	.....	.....	34	33½	.....	.....	605
do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cambria Iron	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ches. & Ohio	.....	.....	23¼	23	.....	.....	23⅞	23½	23¾	23⅛	23⅜	22⅞	9,706
do. 1st pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
do 2d pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col. C. & I	.....	.....	21	.....	21¼	20¾	23	22¼	23	22¼	22¼	....	1,822
Col. Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Colorado Fuel	68½	.....	68½	68¼	68½	.....	70	69	70	69	69½	69	3,558
do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col., H. V. & Tol	28⅛	28	28	.....	.....	.....	29	28⅝	29½	29¼	.....	.....	1,200
do. pfd	.....	.....	69	.....	70	.....	.....	.....	72	.....	.....	.....	235
Col. & H. Coal	.....	.....	19⅛	18⅛	20	19⅜	19	18¼	21	18	20⅜	19½	3,400
do. pfd	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cons. Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Del. & Hud. C	128	127⅜	128	127⅛	128½	127½	129¼	128⅜	130	129¾	129⅝	129½	6,034
Del., L. & West	146½	145½	145¾	144⅝	147	144¾	147½	146¾	146½	....	147	146½	27,242
Hunt. & B. Top	.....	.....	35½	.....	35½	.....	.....	.....	37	36	.....	.....	583
do. pref	.....	.....	50½	....	50⅝	50½	52	51	53	.....	.....	.....	601
Lake Erie & Wes	22	.....	22	21½	22	.....	22½	22⅜	22⅞	22⅜	22½	22¼	2,920
do. pref	76¾	.....	76¾	.....	76¾	.....	78	77½	.....	.....	.....	.....	603
Lehigh C. & N	52½	52⅜	52	51½	52	51½	52	51¼	.....	.....	.....	.....	974
Lehigh Valley	49	46½	48⅝	45	48⅝	45	49	44	47⅛	46⅝	.....	.....	29,084
Mahoning Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maryland Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morris & Essex	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Cent. Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. J. Central	119½	119	119	118½	119½	119	120⅛	120	121	120	119¾	119½	3,296
N. Y., L. & W	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Y., L. E. & W	22⅞	22⅝	22½	21⅜	22⅞	22⅝	22¼	21⅜	22½	22	22	21⅝	42,615
do. pref	.....	.....	50	48½	.....	.....	49¾	48¾	.....	.....	48½	48	2,540
N.Y., Susq. & W	17	16¾	17⅛	16¾	17¼	16¾	17¾	17⅛	17⅝	17⅛	.....	.....	5,475
do. pref	65	.....	65	64½	65	.....	68½	66¾	67½	.....	67½	.....	1,360
N. & West	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Penn. R. R	54	53¾	53¾	52½	53¼	52¼	53⅝	53⅛	53½	53¼	.....	.....	8,311
Phil. & Reading	27⅞	28¼	28⅜	25½	27¼	27	28	26	27⅛	26	27⅜	25⅝	611,820
Tenn. C. & I	28¾	25⅞	27½	25¾	29¼	26½	29	27⅝	28⅞	28⅛	28¾	28	16,305
do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wheel. & L. E	18⅜	18	.....	.....	18⅜	18	18	.....	.....	.....	.....	.....	225
do. pref	61	.....	.....	.....	61	.....	61¾	60⅞	61	60⅜	60¾	.....	880

Total shares sold, 781,814.

INDUSTRIAL AND TRUST STOCKS.

NAME OF STOCKS.	Feb. 25.		Feb. 27.		Feb. 28.		March 1.		March 2.		March 3.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams Express	.....	.....	475⅜	465⅜	481⅛	465⅜	501¼	485⅛	51	491¼	511¼	495⅛	61,985
Am. Cotton Oil	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
do. pref	48¾	47½	81	80½	80½	....	82¾	81½	82½	82¼	82½	.....	1,805
Am. Dist. Tel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Am. Express	.....	.....	.....	.....	.....	.....	118	.....	118	.....	.....	.....	17
Edison E. Ill. Co.	.....	.....	.....	.....	.....	.....	124½	.....	126½	124½	.....	.....	1,064
Edison E. L. Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Edison Gen. El	107¾	107⅛	107	103½	106	105⅞	107	105	106¾	105	106½	105⅜	3,503
do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nat. Cord. Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
do. pref	.....	.....	110	...	109½	109	111	108½	111	.....	.....	.....	370
do. New	63⅜	61⅜	63	61	62½	59⅜	62⅜	57¼	63⅜	58	64	61⅝	85,142
Nat. Lead Co	40¾	39	40	39¼	41⅜	39½	42¼	40⅜	41⅜	41	41⅛	40	22,888
do. pref	89	88¼	88⅝	88	89½	88½	89¾	89	91¼	.....	89¾	89¼	3,979
Nat. Linseed Oil	36¾	.....	37	36¾	37	.....	37¾	37	.....	.....	.....	.....	2,260
So. Cotton Oil	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
U. S. Express	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
U. S. Rubber	43¾	43½	43⅜	43	.....	.....	44½	.....	44½	.....	44½	44	1,070
do. pref	.....	.....	.....	.....	.....	.....	94	.....	.....	.....	.....	.....	100
Wells, Fargo Ex	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Western Union	96¼	95⅝	95¾	94¼	95⅞	94⅜	96⅞	96	96¾	96¼	96⅜	94⅞	31,226

Total sales, 245,349.

CALIFORNIA.

San Francisco.

NAMES OF STOCKS.	CLOSING QUOTATIONS. Feb. 24.	Feb. 25.	Feb. 27.	Feb. 28.	Mar. 1.	Mar. 2.
Alpha	.....	.....	.....	.....	.....	.....
Alta	.15	.15	.15	.15	.20	.15
Belcher	.75	.75	.75	.70	.75	.65
Belle Isle	.....	.....	.....	.....	.....	.....
B. & Belch	1.65	1.60	1.65	1.55	1.60	1.50
Bodie	.05	.05	.05	.05	.05	.05
Bulwer	.15	.15	.15	.15	.15	.20
Challar	.55	.55	.55	.40	.45	.40
Com'w'lth	.....	.....	.....	.....	.....	.....
Con. C. & V.	2.85	2.70	2.70	2.45	2.60	3.25
Con. Pac.	.....	.....	.....	.....	.....	.....
Crown Pt.	.50	.55	.55	.50	.50	.45
Del Monte	.....	.....	.....	.....	.....	.....
E'rekaCon	.....	.....	.....	.....	.....	.....
G'ld & C'y	.95	.90	.90	.90	.85	.80
Hale & N.	1.25	1.25	1.20	1.15	1.10	1.05
M. White	.....	.....	.....	.....	.....	.....
Mexican	1.85	1.70	1.85	1.65	1.70	1.65
Mono	.05	.05	.05	.05	.05	.05
Mt. Diablo	.....	.....	.60	.....	.....	.....
Navajo	.....	.....	.85	.....	.....	.....
Nev. Qu'n	.....	.....	.....	.....	.....	.....
N. B'lleIsle	.....	.....	.....	.....	.....	.....
N. Co'w'th	.....	.....	.....	.....	.....	.....
Ophir	2.20	2.10	2.20	2.00	2.00	1.90
Potosi	1.25	1.25	1.35	1.20	1.20	1.10
Savage	.90	.85	.85	.75	.80	.70
Sierra Nev	1.25	1.25	1.25	1.20	1.20	1.15
Uni'n Con	1.10	1.05	1.05	1.00	1.00	.90
Utah	.15	.20	.15	.10	.10	10
Yel. Jack	.50	.65	.60	.50	.60	.50

COLORADO.

Aspen. Feb. 25.

	Bid.	Asked
Argentum Juniata	$0.65	$0.66
Aspen Contact	1.00	1.10
Aspen Deep Mining	.10	.11
Best Friend	.10	.12
Bi-Metallic	.12	.14
Bushwacker	.20	.23
Delia S.	1.90	2.00
Gold Valley Placer	....	.15
Little Annie	.07	.10
Mollie Gibson	7.50	8.00
Pontiac	.10	.12
Smuggler	16.50	17.00
St. Joe & Mineral Farm	.11	.13
U. S. Paymaster	....	.20

Colorado Springs. Feb. 25.

	Bid.	Asked
Anaconda Gold	.41	.42
Calumet	.11	.12
Cleopatra	.09	.20
Fanny Rawlins	.20	.22
Gold & Globe	.07	.07½
Gold King	.27	.28
Isabella	.16½	..
Jack Pot	.02	.02
Jeff Davis	.02	.04
Lemhi	1.25	..
Manitou Park	....	.10
Matoa	.07	.10
Ophir	11	.12
Orphan Bell	.06	.07
Pearce-Jensen Reduct'n Co.	.07	.08
Pharmacist	.26	.28
Summit M. & M	.26	.28
Work	.08	.08½
World	.04½	.05

Denver.

Prices and sales for the week ending February 18th:

	High.	Low.	Sales.
Anaconda	$0.42½	$0.36	11,400
Amity	.01¾	.01½	4,000
Bangkok-Cora Belle	.02¼	.02¼	2,200
Brownlow	.03	.02½	3,700
Clay Co	.01¾	.01½	5,500
Diamond B	.01½	.01½	2,600
Gettysburg	.06	.04	4,200
Gold Rock	.04¾	.04	2,600
Golden Treasure	.06½	.06½	500
Justice	.01½	.01½	2,000
Orphan Boy	.02½	.02½	500
Tam O'Shanter	.02½	.02½	500
Work	.09¼	.08½	23,100
Total sales			62,800

Rico. Feb. 25.

Atlantic Cable Cons. M. Co	$0.25
Atlantic Cable guaranteed	.70
Enterprise Mining Co	3.50
Iron Dollar Silver Mines Co	.25
Southern Cons. Treasury Stock	.20
Uncle Ned Co	.35

MARYLAND.

Baltimore, Mar. 2.

COMPANY.	Bid.	Asked.
Balt. & N. C	....	.10
Conrad Hill	....	.02
Cons. Coal	....	.27½@.28
George's Creek Coal.	1.04	1.06
Howard C. & C.	1.10	....
Lake Chrome	....	.05
Silver Valley	.72@.80	.77@.80

MINNESOTA.

Duluth. Feb. 28.

LISTED STOCK.

	Par.	Bid.	Asked
Biwabik M. Iron Co	100	32.00	36.00
Cincinnati Iron Co	25	1.90	2.00
Clark Iron Co	100	.40	1.00
Cosmopolitan Iron Co	...	.50	....
Great Northern Min. Co.	100	8.00	9.25
Kanawha Iron Co	100	2.50	2.60
Keystone Iron Co	...	....	1.00
Lake Superior Iron Co	25	2.50	2.75
Lincoln Iron Co	...	.15	....
Little Mesaba Iron Co	100	4.50	6.00
Mountain Iron Co	100	82.50	95.00
Minneapolis Iron Co	100	.15	....
Mesaba Moun. Iron Co.	100	22.00	25.00
Shaw Iron Co	100	6.50	7.60
Security Land & Exp. Co.	10	22.50	30.00
Washington Iron Co	100	....	1.00

UNLISTED STOCKS.

Allegheny Iron Co	10	.02½	.05
Aurora Iron Co	...	....	.75
Buckeye Iron Co	100	....	2.50
Chicago Iron Co	100	1.50	2.25
Charleston Iron Co	100	2.80	3.00
Champion Iron Co	100	.50	.75
Comstock Iron Co	100	.10	....
Columbia Iron Co	100	....	2.75
Camden Iron Co	..	....	.75
Detroit Iron Co	25	.15	....
Dayton Iron Co	100	.15	....
Great Western Mining Co.	100	4.30	....
Horton Mining Co	10	.06	....
Homestead Iron Co	25	.04	.08
Kentucky Iron Co	100	.15	....
Kakina Iron Co	25	....	2.00
Lackawanna Iron Co.	100	.75	.85
McCaskill Mining Co	....	.07	.10
McKinley Iron Co	100	..	28.50
Mesaba Chief Iron Co	100	8.10	....
Mesaba Iron Co	..	....	.85
Myrna Iron Co	10	....	.25
Northern Light Iron Co	100	.10	....
New England Iron Co	100	2.00	....
Ohio Mining Co	100	10.50	12.50
Oneota Iron Co	100	....	.50
Pennsylvania I. & S. Co.	100	.30	.50
Rouchleau Iron Co	100	.80	1.00
Republic Iron Co	25	.55	.75
Red Hematite Iron Co	100	....	25
Standard Ore Co	25	1.00	3.00
Towanda Iron Co	100	1.75	2.50
Zenith Iron Co	25	1.75	3.00

MISSOURI.

St. Louis. Feb. 28.

Closing quotations:

	Bid.	Asked.
Adams	.92½	....
American & Nettie, Colo	.20	....
Bi-Metallic, Mont	7.50	8.00
Elizabeth, Mont	.48¾	.51¼
Granite Mountain, Mont	7.30	7.40
Hope	3.00	....
Montrose Pl	....	.05

MONTANA.

Helena.

Prices for the week ending February 18th:

	High.	Low.
Bald Butte (Mont.)	$2.50	$2.10
Benton Group (Neihart), Mont	.25	.20
Combination (Phillipsb'g), Mont	1.50	1 25
Cumberland (Castle), Mont	.25	.15
Elizabeth (Phillipsb'g), Mont	.45	.42½
Florence (Neihart)	.22½	.17½
Helena & Victor, Mont	.80	.65
Iron Mountain (Missoula), Mont	.82½	.75
Poorman (Cœur d'Alene), Idaho	.75	.60
Whitlach Union & MacIntyre	.50	.40

(Special report by F. M. DAVIS.)

PENNSYLVANIA.

Pittsburg. Feb. 15.

	Bid.	Asked.
Bridgewater Gas Co	27.00	40.00
Chartiers Val. Gas	10.00	11.00
Enterprise Mining Co	....	3.00
Hidalgo Mining Co	5.50	6.50
Juster Mining Co	10.00	10.38
Manufacturers' Gas	....	30.000
N. Y. & Clev. G. D	50.00	51.50
Pennsylvania Gas	....	10.25
People's N. G. & P. Co	14.63	....
Philadelphia Co	22.00	22.25
Tuna Oil	....	20.00
Wheeling Gas Co	20.50	21.75
W'house Air Brake Co	138.50	140.00

Philadelphia. March 2.

	Bid.	Asked.
Bloomington C. & C	....	....
Buck Mountain C	....	....
Cambria	72	....
Connellsville Gas Co	....	....
Excelsior B. & S	....	....
Locust Mt. C. & I	....	....
Penn. Salt	104½	....
Penn. Steel	123	....
Penn. Gas Coal	....	....
Royal Gas	....	....
Westmoreland C	70	....

SOUTH DAKOTA.

Deadwood. Feb. 26.

	Bid.	Asked.
Deadwood Terra	$1 50	$1.75
Double Standard	.22	.25
Golden Reward	1.40	1.50
Hawkeye	.62	.65
Iron Hill	.12½	.15
Isadora	.25	.30
Mutual	.01¼	.01¾
Ruby Bell	.22	.25
Seg. Iron Hill	.01	.01½
Tornado	.25	.30

Pipe Line Certificates.

Week Ending March 3.

	High.	Low.	Sales.
Feb. 25	...	...	.....
" 27	63	62¼	34,000
" 28	63½	62¾	40,000
March 1	...	....	.....
" 2	...	...	.....
" 3	64⅛	...	10,000
Total sales in barrels			84,000

FOREIGN QUOTATIONS.

London. Feb. 18.

	Highest.	Lowest.
Alaska Treadwell	£2¼	£2
Amador, Cal	1s.	6d.
American Belle, Colo.	£⅛	9d.
Can. Phosphate, Can.	£½	£¼
Colorado, Colo	.....	£⅛
De Lamar, Idaho	£17-16	£15-16
Dickens Custer, Idaho.	7½s.	4½s.
Eagle Hawk	....	....
Eberhardt, Nev	....	....
Emma, Utah	1s.	6d.
Esmeralda, Nev	.....	....
Flagstaff, Utah	10½s.	7½s.
Golden Leaf, Mont	....	....
Jay Hawk, Mont	9s.	8s.
La Luz, Mex	7½s.	4½s.
La Plata, Colo	1s. 3d.	9d.
Maid of Erin, Colo	£⅜	£⅛
Mammoth Gold, Ariz.	1s.	6d.
Montana, Mont	3s. 6d.	2s. 6d.
Mount McClellan	4s.	3s.
New Consolidated	....	....
New Guston, Colo	15s.	10s.
New Hoover Hill, N.C.	....	2s. 6d.
New Russell, N. C	....	....
New Viola, Idaho	....	....
Old Lout, Colo	....	....
Parker Gold, N. C	....	....
Pittsburg Cons., Nev	2s. 6d.	1s. 6d.
Poorman, Idaho	7s. 9d.	7s. 3d.
Plumas Eureka, Cal.	11s	9s.
Richmond Con., Nev.	£9-16	£7-16
Ruby, Nev	6s.	3s.
Sierra Buttes, Cal	7s.	5s.
" Plumas Eur., Cal.	£9-16	£7-16
Silver King	6s.	3s.
United Mexican, Mex.	2s. 6d.	1s. 6d.
Yankee Girl, Colo	2s. 6d.	1s. 6d.

Paris. Feb. 18.

	Francs.
Belmez, Spain	621.00
Golden River, Cal	130.00
" " parts	30.00
Laurium, Greece	635.00
Lexington, Mont	91.25
" parts	2.00
Nickel, New Caledonia	795.00
Rio Tinto, Spain	386.25
" " oblig.	517.00
" " " 2d	512.50
Tharsis, Spain	116.25
Vieille-Montagne, Belgium	508.75

ASSESSMENTS.

COMPANY.	No.	D'l'nqt in office.	Day of sale.	Amt. per sh're.
Andes, Nev	39	Feb. 24	Mar. 16	.25
Belcher, Nev	45	Mar. 14	April 4	.50
Belle Isle, Nev	17	Feb. 14	Mar. 8	.10
Best & Bel, Nev	53	Feb. 21	Mar. 14	.25
Caledonia, Nev	45	Mar. 2	Mar. 23	.10
Challenge, Nev	14	Mar. 16	Apr. 6	.20
Con. St. Gothard, Cal	7	Mar. 17	May 6	.05
Crown Pt., Nev	60	Mar. 30	Apr. 20	.25
Dalton, Utah	..	Mar. 8	Mar. 18	.01
Excheq'r, Nev	35	Mar. 1	Mar. 22	.10
El L'p'ido, Mex	2	Mar. 3	Mar. 28	.05
Independence, Nev	18	Mar. 6	Mar. 29	.05
Jack Rab't, Cal	2	Feb. 16	Mar. 7	.05
Justice, Nev	53	Feb. 9	Mar. 2	.10
Morgan, Cal	16	Mar. 6	Mar. 30	.10
Navajo, Nev	24	Feb. 13	Mar. 7	.10
Nevada Q., Nev	53	Feb. 21	Mar. 14	.25
N. Belle Isle, Nev	22	Mar. 3	Apr. 3	.10
N. Commonwealth, Nev	4	Mar. 2	Mar. 7	.10
Overman, Nev	66	Feb. 14	Mar. 30	.25
Seg. Belcher & Mides, Nev	11	Feb. 7	Feb. 27	.25
Silver Hill, Nev	32	Mar. 21	Apr. 11	.05
S. Eureka, Cal	2	Feb. 10	Mar. 6	.02
W. Con. Va. & C., Nev	1	Feb. 23	Mar. 15	.25